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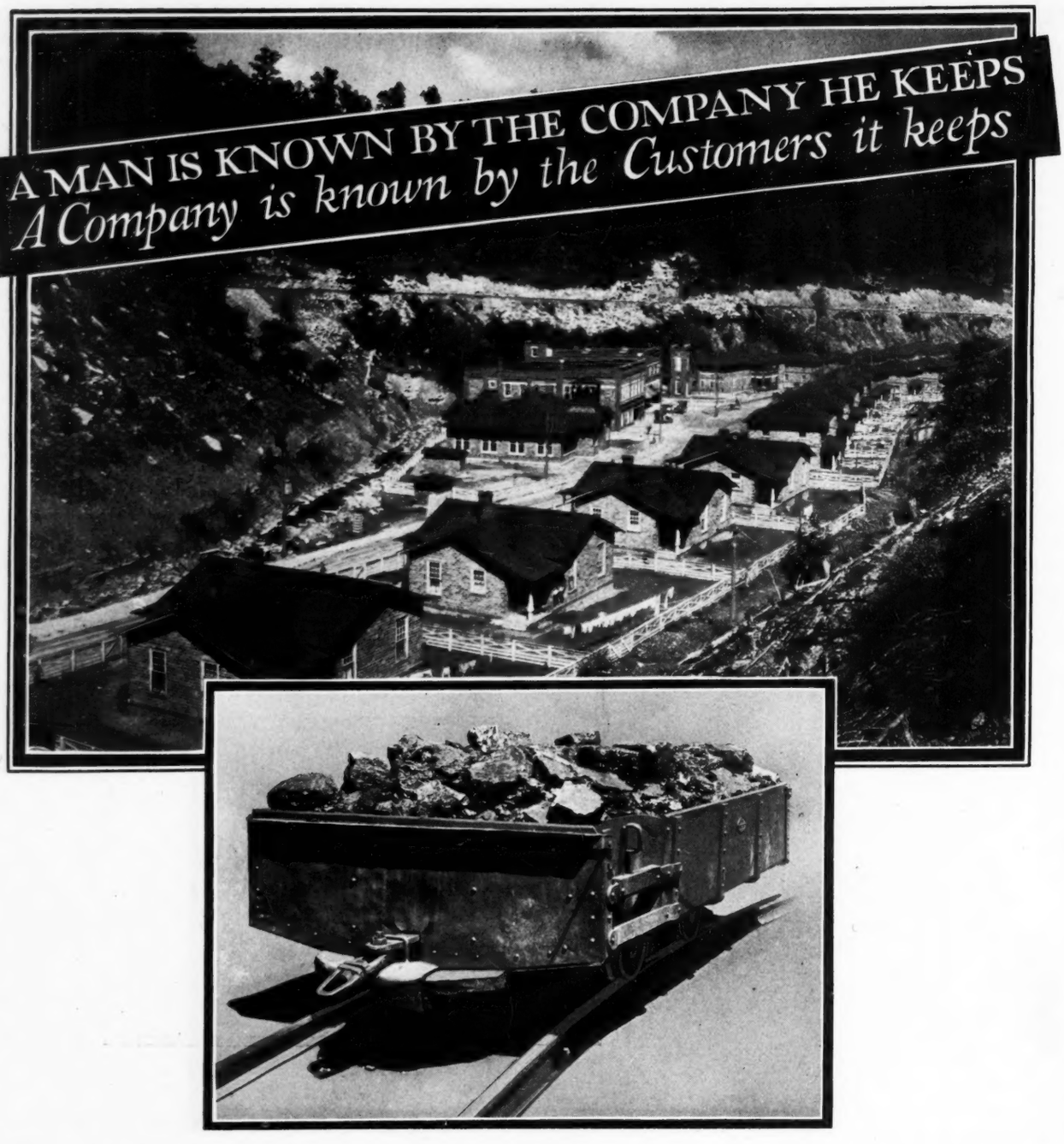

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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Volume 30 — New York, September 23, 1926 — *Number* 13

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COAL AGE

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With which is consolidated "The Colliery Engineer" and "Mines and Minerals"
R. DAWSON HALL, *Engineering Editor*

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When the Machinery Starts By Telephone

Lasting advancement, in mining as in other industries, usually takes place in small increments. Improvement is added to improvement with succeeding installations. Sometimes equipment is adapted from other industries. Next week J. H. Edwards will describe how, at a mine in Kentucky, an automatic substation, supplying current for underground operation, and in which no attendant is stationed, may be started from any one of several distant points by telephone. Not only this but the machinery thus put into operation telephones back to the man who started it that it is "on the job" and working properly.

Many other unique methods are employed at this operation. Thus, the larry that transfers the product of the upper bed to the point where it begins its journey down the mountain side to the railroad tracks in the valley, is remotely controlled. The motorman remains at the loading point and is out of harm's way even if an accident should occur.

Experiments In Machine Loading

Next week also, Scott Dupont of the Colorado Fuel & Iron Co., will describe some experiments conducted by his firm in methods of mining and machine loading. Few subjects today are fraught with keener interest to the mining man. And it is only by experiment, by methods of cut-and-try, that ultimate success will be attained.

The foregoing are only a few of the "high lights." It will require a careful reading of the entire issue to reveal all of the real meat and information that the paper will contain.

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"How does it separate out the coal and light material?"

How the Rhéolaveur System accomplishes this separation is demonstrated by many installations. We spoke of having classified the material in the launder into different strata—the lighter material, or the coal, being on top, and the heavier material, or rock, being on the bottom. There are intermediate gravity materials in the feed usually called bone which stay on top or bottom according to their specific gravity.

Just beyond the primary classification launder a slot is cut in the bottom of the launder beneath which is attached a Rhéo box. A Sealed Level Plant Rhéo Box is illustrated in the cut on this page. As the stratified stream of feed and water passes over this slot the slow moving bottom layer of heavy gravity refuse drops through the slot into the Rhéo box. In order to prevent the loss of light gravity bone and coal with the refuse and to occupy the space in the launder left by the discharged refuse, a stream of water is injected into the Rhéo box. As the discharge from the Rhéo box is sealed by the elevator housing, this water passes up through the slot into the launder. Adjustment of this water controls the quality of material passing through the slot.

The material passing over the first slot consists of coal, bone of various grades and perhaps some refuse, and classifies in the launder before reaching the second slot and Rhéo box. Here the velocity of flow is lower and no water is injected into the Rhéo box so that lower gravity materials or bones can be discharged. These are returned by an elevator to the top of the launder and are reclassified with the original feed.

This regulating or rewash material is fed back into the launder in order to build up a deep bed of bone separating as far as possible the heaviest rock on the bottom from the lightest coal on the top, thereby destroying the sensitiveness which is ordinarily the objection to launder types of washers and enabling a separation of the bone into light, low-ash bone with the washed coal and heavy, high-ash bone with the refuse.

Further steps in the process will be described in future advertisements appearing in *Coal Age*. Watch for the next Rhéolaveur page and send for our latest bulletin.

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Rhéo Box

COAL AGE

McGRAW-HILL PUBLISHING COMPANY, INC.
JAMES H. McGRAW, *President*
E. J. MEHREN, *Vice-President*

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

R. DAWSON HALL
Engineering Editor

Volume 30 NEW YORK, SEPTEMBER 23, 1926 Number 13

Learn from the Ads.

THREE factors determine the degree of success attained by any coal mine—men, methods and machinery. Two weeks ago the editorial pages of this magazine set forth the men and the methods of New Orient, but the equipment could only be covered in a general and limited way. The advertising section of the present issue gives far more minute details of this machinery than could possibly be crowded into any editorial section.

Much valuable information may, therefore, be gleaned from these pages. It is known that a certain high coal mine executive, the president of one of the big anthracite companies, has kept the equipment section of one of these special issues in his desk, for purposes of reference, for three years. These pages are, therefore, well worth perusal and preservation.

International Mine-Rescue And First-Aid Contests

A FIRST-AID MEET was recently held in San Francisco in which 44 teams representing 13 states participated. Simultaneously a mine rescue contest was staged with 14 teams from eight states competing for honors. This was the fifth international meeting of its kind and although the term "international" is not today significant, countries other than our own, in time, will doubtless send their best teams.

This safety meeting was an unqualified success and a credit to the mining, petroleum and industrial companies sufficiently enterprising to send their representatives. Some sacrifices are involved in participating in contests of this kind and were it not for the generous support given by western mining companies and the mineral, petroleum and industrial interests of California, the general expense of such a gathering would have been an almost insurmountable obstacle. The Society of Safety Engineers of California also contributed in a large measure to the meet's success.

Bringing together a number of groups of workers, from various industries and different states, is of great benefit in that it affords opportunity for an exchange of ideas and a comparison of equipment and methods. In the mine rescue contest at San Francisco a variety of equipment was noticeable. Undoubtedly one of the by-products of this contest will be a tendency on the part of industrial companies to adopt the latest and simplest oxygen apparatus. The best present types of such equipment will be greatly improved, with, perhaps, a reduction in weight. Present accessory devices also admit of some simplification. Just how far the elimination of what are now considered to be important accessories will extend can only be determined by actual experience.

Safety propaganda is essential and pressure from without is needed to extend safe practices throughout privately conducted industries. The seed has been sown and the safety movement has made substantial progress since it was initiated in the mining industries by the U. S. Bureau of Mines almost twenty years ago. However, a greater appreciation of safety and the value of human life is needed on the part of the general public. Our streets and roads are more dangerous today than a well conducted mine. The hazard involved by the automobile needs to be decreased and public agencies as well as the automotive industry can find ample opportunity for furthering safety in so far as it is affected by the widespread use of the auto.

Have We an Export Future?

AMERICAN COMPETITION in the world coal markets is taken much more seriously in Great Britain and in Germany than it is in the United States. While the present upward swing in overseas shipments of bituminous coal appears to alarm nervous Englishmen and moves German observers to painstaking study, the great majority of American coal men probably look upon it as an episode as transient as "the snows of yesteryear."

And why not? The promises of permanency evoked by the war-time boom and by the record-smashing totals piled up in 1920, when bituminous export shipments exclusive of Canada reached 19,907,955 gross tons, were broken. When the British strike, which started the current unusual movement is ended, another sharp drop in exports is inevitable. It may be a few weeks, or even months, before the change is fully reflected in the clearance figures, but that is merely a matter of detail. When the collapse does come, is there any reason to suppose that we shall salvage more out of the wreckage than we did in the earlier years?

In some respects our chances are less. Unlike the coal industry of the Ruhr, for example, we have made little concentrated drive for new business in countries where we might expect to retain the status temporarily thrust upon us by the British strike. Over sixty per cent of the tonnage shipped from Hampton Roads and Baltimore during the eighteen weeks ended Sept. 2 was cleared for the United Kingdom. There, naturally, was a yawning gap to be filled and the American coal trade is demonstrating its capacity for emergency service. Something more than optimism, however, would be required to believe that any part of this particular business is permanent.

Aside from Italy, which for years has been our best trans-Atlantic customer, shipments from the United States to Continental Europe have been disappointingly small. France, which bought over 3,600,000 tons in this country in 1920, purchased less than 60,000 tons in the eighteen-week period under review. Portugal, Spain and Norway also fall far short of touching their 1920 rates of importation. Sweden, which took nearly 1,250,000 tons, and Switzerland, which called upon the United States for over 800,000 tons six years ago, do not appear at all in the list of buyers. Belgium, too,

is missing. Patently the coal fields of Continental Europe no longer struggle under the handicaps of the destruction of Mars.

South America, which many students of foreign trade insist is the logical market to be cultivated by coal exporters of the United States, shows up better. Argentine and Brazil have been buying North American coal in quantities considerably in excess of the monthly averages for any year since 1920. But it is chastening to recall that the combined total to these two countries dropped from 2,712,036 tons in 1920 to 734,464 tons last year. The fuelling of the Egyptian State Rys. again is in American hands, but it is not to be assumed that England will lightly relinquish actual control.

The picture, however, is not all shadows. The interest which other coal exporting nations are displaying in American plans is a subtle acknowledgment of the potentialities of competition from this country. There is, too, a greater willingness upon the part of foreign traders and consumers to concede the excellent qualities of the better grades of American coal. In fact, the manner in which gas and steam coals have been accepted by British users is the source of much of the alarm now being expressed in England. Discounting, as we must, the propaganda in these reports, nevertheless they embody an admission of American worth which foreign rivals long have been reluctant to make.

Under existing conditions American coal exporters must be content to look forward to a slow and very moderate expansion in overseas shipments, interrupted from time to time by unhealthy booms such as the trade now is experiencing. The larger and more rapid growth justified by the quality of the coal, accessibility and coal-handling facilities is denied them—primarily by causes beyond their control. What the United States lacks to make foreign trade in coal great is integration of shipping and finance with commerce. Until the bankers, the ship owners and the railroads enter into a full partnership with the exporter, progress in increasing foreign business in coal will be a case of arrested development.

Safety in Rocky Mountain Region

IN HIS USUAL BLUFF and uncompromising way Dan Harrington in a letter addressed to the Rocky Mountain Coal Mining Institute called attention to the preeminently high fatality rate of the Western mines. His note was received with incredulity, and many ways were at first sought to explain his statements away but these alibis were soon seen to be fallacious.

That the Western mines have too many accidents cannot be gainsaid, but it does not follow that this is by reason of excessive laxity. The coal is often thick and the roof, accordingly, is difficult to inspect. Moreover, as someone has facetiously said: "When a small piece of rock falls twenty feet, you are almost sure to be killed, but if it falls only a foot you are likely to be merely surprised."

It would serve little to record the dangers encountered in Western mines—the extreme dryness, the presence of resin in the coal, the pitching beds, the thick seams, the readiness of the coal to ignite. It would be better, perhaps, to record what has been done to meet the dangers involved. The West has led the East in formulating such solutions. It was in a Victor-American Fuel Co. mine that incombustible dust was first applied by machine. The first mine to place shelves laden with inert dust was Delagua, in Colorado. Adobe was sprinkled in the Reliance mine at a very early date.

The first coal producer in America to fit up a mine rescue car was the Colorado Fuel & Iron Co., and it was the first or nearly the first to humidify the mine air.

Incombustible stemming was first used in this country in the mines of the Utah Fuel Co. and that firm initiated also the practice of shooting coal by throwing a switch on the surface.

The sprinkling of cutter bars was originated at Hanna in 1913, and storage-battery locomotives were first used for main haulage in the Phelps-Dodge mines in New Mexico. Among the earliest to fireproof all underground wooden construction—powder boxes, doors, brattices, etc.—were the mines of the West.

After every major mine accident new precautions have been adopted and usually these have been made standards for the rest of the United States. Much still remains to be done. The question of blame may be laid entirely to one side. The important matter is the fatality rate. Where it is so high as in the West the problem is one that must be most seriously considered in all its phases, and the Rocky Mountain Coal Mining Institute, the first technical coal-mining society in the United States to have a permanent safety committee, is to be congratulated on its breadth of vision and its vigor. Every little while the industry specializes on some form of hazard and forgets the rest. It seems that the West could do no better than to put among the first and most important of its precautions rock-dusting, complete ventilation and adequate examination for gas.

For a Night's Rest?

ON A HOT NIGHT in August how much more would you be willing to pay if the sleeping car were cooled to the refreshing temperature that is maintained during hot weather in certain refrigerated theaters? With a strenuous day ahead, a full night of rest rather than hours of tossing and tumbling in a "bake oven" would be worth a substantial percentage of the combined railroad and sleeping car fare.

Keeping the car in a refrigerated terminal building until a short time before the train left in the evening as compared to letting it stand in the "boiling" sun or even in a sun-scorched shed, would add wonderfully to the comfort of a night's travel. But this would be a half-way measure and the American people are not satisfied with "half-way" measures when a full measure may be had.

The time has come when the temperature in sleeping cars and other first-class coaches should be under control at all times. In winter, steam from the terminal heating plant or from the locomotive maintains the car at a temperature above that existing outside. It is just as reasonable that a cooled fluid from a terminal refrigerating plant or from a plant carried on the train itself should be used on the car to counteract the high temperature so often encountered in summer travel.

Here lies another use for power—and the field is that of coal. The motor bus which has taken much of the short-haul passenger business from the railroads, is now encroaching on the longer hauls, especially during the summer months. Proper temperature control of railroad cars will tend to halt this trend. Furthermore, it will supply a comfort, the cost of which the public will be glad to pay.

Plan Safety and Efficiency at Mountain Resort

Rocky Mountain Coal Mining Institute Members Pool Ideas—Creosoting Brings Big Savings in Two Years—Shearing and Top Cutting Favored —Underground School for Green Miners—More Drastic Safety Rules

By R. Dawson Hall
Engineering Editor, *Coal Age*, New York City

MEMBERS OF THE Rocky Mountain Coal Mining Institute to the number of about seventy from Colorado, Wyoming, New Mexico and Utah with a few from states not embraced within the mountain area attended the meeting at Glenwood Springs, Colo., on Sept. 9 to 11. F. T. Baker, a superintendent for the Colorado Fuel & Iron Co., on the morning of the first day discussed the preservation of timber at the Primero mine, Primero, Colo., by the use of Aczol and creosote. This mine provides a good opportunity for exhibiting the value of timber preservation, as, without treatment, some of the timber lasts only two years. The cost of posts is about 15c. per lineal foot, and the expense involved for labor and material used in creosoting is about 7.6c. Consequently preservation adds only about 50 per cent to the costs and after two years it is possible to show a large profit, even in the cost of timber used, without any consideration of the expense of renewals.

Mr. Baker said that the penetration of creosote was from ⅛ to ½ in. and that this was insufficient to protect the timber if it was cut for fitting and framing subsequent to treatment or even if it was roughly handled and abraded after the creosote was applied. However, a brush coat could be put on such surfaces, making up in a large degree for the exposure of the interior wood. He stated that the timber was cut and peeled in June and left for three or four months to dry out, after which it received its immersion in creosote. If it was green when creosoted, the treatment was practically useless; if well-seasoned a good penetration could be obtained in one hour. If not completely dried out, it might be necessary to immerse it for two hours.

The cost of creosote was 33c. and that of the diluted Aczol 15c. per gallon. He declared that the chemical treatment appeared to strengthen the timber. The time of exposure was for the chemical 4 years and for creosote 3½ years, but he felt confident that all the timber treated would last much longer without losing its effective value. He said that he was doubtful whether the treatments made the timber fire-resistant, and that on this point he had no data. Certainly, however, the danger from fire was greatly lessened because the timber did not rot and rotten wood represents a distinct hazard.

William Littlejohn, mine operator, of Price, Utah, said that in the State of Washington much of the timber used in the mines was from fallen trees and was obtained free of charge other than the cost of cutting and transportation to the mine. This amounts to only about 1½c. per foot. Peeled timber at the mine costs only 5c. a lineal foot, and unpeeled timber off the stump costs little if any more than fallen timber delivered at the mine.

Such timber was so cheap that preservation could be of value only inasmuch as it saved the expense of replacement. The principal woods used in the mines of Washington were cedar, mountain ash and elm.

Mr. Baker said that though the open-tank method had been used throughout, he thought that the pressure treatment would be desirable.

Charles Billington, assistant general superintendent, Rocky Mountain Fuel Co., Lafayette, Colo., stated that most of the ships crossing the North Sea to England had in tow large floats of mine timber. This immersion in salt water seemed to be efficacious in lengthening the life of the wood. Accordingly when he was with the Northern Coal & Coke Co. he decided to try the effect of lime and salt in preserving the timbers at the mines of this company.

Untreated timber in 12 months would decay to such an extent as to fail from its own weight. The roof would be left standing, but the timbers would fall away from it. In a few months fungus would be hanging down 2 to 3 ft. from the collars. For this reason he dipped the timber in saturated solutions of lime and salt. This was in 1907. In 1910 he left the company, but there was no fungus growth up to that time. He did not assert that lime and salt were preferable to other materials as preservatives, but he certainly had found them helpful in the operation of mines. They hardened the timber and improved it.

Where the Institute Convened

Glenwood Springs is at the junction of the Colorado River and Roaring Fork in Garfield County, Col. The latter stream was once known as the Grand River, but two years ago its name was changed. Glenwood Springs is a bright, clean, prosperous little county seat with several good hotels, but it was even more prosperous when the metal mines were more active than they are today. It is located 5,800 ft. above sea level.

J. H. Emrick then read a paper on the "Shearing of Coal," contending that shearing had proved of value in many coal mines despite the recorded experience of a certain mine manager who declared that it had not proved successful at his operation. Benedict Shubart remarked that at a mine that produces about 275 tons daily from the No. 6 bed of Illinois, which has an average thickness of 5½ ft., a shearing machine was introduced. Prior to its arrival the coal had been merely undercut with a shortwall machine to a depth of 6 ft. To break down the coal, two shots were used in the entries and three in the rooms. The proportion of lump, measured over 2-in. screens, obtained by this method of cutting and shooting was 58.2 per cent.

The single shearing machine easily cut the entire tonnage of the mine so that after it was installed all the coal dumped into the railroad cars was coal that had been mined with the aid of this machine. Accurate records were kept of the railroad weights, and from these data the percentages of lump and slack were calculated. In the month of June the proportion of lump produced over the 2-in. shaker screens was 69.9 per cent, thus demonstrating that the proportion of lump was increased 20 per cent.

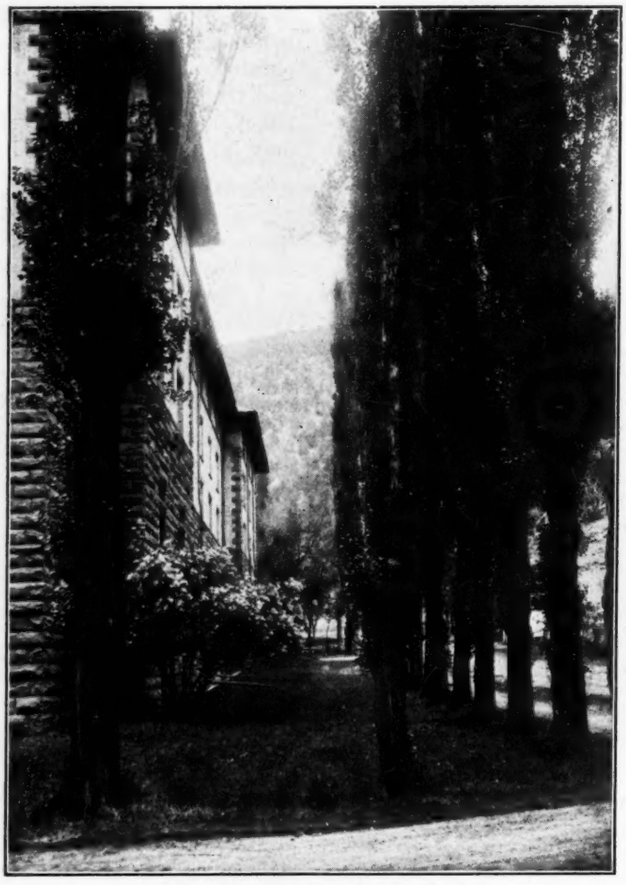
The entries from which the coal was mined were 10 ft. and the rooms 30 ft. wide. The coal was sheared in the center of the face in all cases. A hole was drilled near each rib, and the coal shot down with one-half the powder required when the places had been undercut only. As the coal was broken down to the back of the cut, little pickwork was necessary to complete its dislodgement.

Shearing, said Mr. Shubart, (1) increases the percentage of lump and thus the average price received for the product, (2) assists in preserving a tender top because less explosive is used, (3) facilitates the handling of the coal by the miner, thus increasing the tonnage, and (4) in union fields eliminates coal yardage in entries and crosscuts 10 ft. wide or less, because with a shearing cut a loose end is provided for the shooting of the coal, thus making it as easy to load out a narrow place as a wide one. This applies, of course, only to union mines where such a differential for narrow places is provided.

Basing calculations on $2.50 per ton for lump and $1.25 for slack the coal before the machines were installed would have brought $1.977 per ton. After shearing was introduced the return would have been $2.123 or 14½c. more. The cost of shearing 275 tons per day would be as follows: Two men @ $8.54 per shift, $17.08; interest on investment and depreciation on machine, $2.80; power, $0.40; upkeep on machine, $1.75; total, $22.03. This would be equivalent to a cost of 8c. per ton, leaving a net profit of 6½c.

William Littlejohn said that the mine manager who had condemned the shearing machine had tried it later in a place where the coal was 13 ft. thick and had declared it a valuable help in obtaining lump. It had halved the quantity of powder necessary to bring down the coal. The machine had not given good results where the coal was only 6 ft. thick.

Asked by B. B. Brewster what were the advantages of the shearing machine where the coal was sold for furnace use and where therefore size was no object, Mr. Emrick replied that greater speed was attained in entry and room driving, the decreased use of powder prevented injury to the roof and thus saved timbering and rock handling. Also there was a saving in expenditure for powder. He said that the shearing machine could be used on a 15 per cent grade cutting down and on an 11 per cent grade cutting up.



Some of Glenwood Springs' Big Trees

The town is a garden spot. Some say the thermal waters account for the height of the poplars and cottonwoods. They seem to grow lustily despite the high altitude.

Much of the discussion was quite away from the subject, strong objection—and equally strong approval—being registered regarding Mr. Emrick's statement that the natural way to shoot coal was down. Mr. Littlejohn said a top cut in coal was as good as a bottom cut. S. W. Farnham added that a top cut saved the roof from injury. It was also of assistance where the bed was overlaid with rash or where the cut was made in the rash. The cut could be scraped out carefully and any loose rash above it could be barred down. The material thus obtained could be disposed of in some manner permitting the coal to be loaded free of impurity. This could not be done where the coal was shot down rather than up.

J. Q. Lalor said that where undercutting and shearing had been introduced in place of undercutting alone the use of powder per ton of coal had been reduced from 5 lb. to a trifle over one pound.

A. E. Anderson remarked that in some coal it was as easy to shoot up as to shoot down and that he took issue with Mr. Emrick in regard to the universality of undercutting where miners cut the coal with the pick. They had in certain mines made their kirving at the top.

W. E. Dickson said that with the 8-ft. Freeport bed, in Pennsylvania, cutting on top had been found desirable because the shots, being placed under the bands near the bottom, "got a better grip on them," as he expressed it, and were better able to break them.

Charles Billington dissented from these statements, especially for cases where the coal pitched. He contended that it was better to shoot down hill. The coal rolled down easily and not so much powder was needed.

W. C. Holman described the local chapter of the Institute that had been established by the Phelps Dodge Corporation at Dawson. Sixty to seventy men meet once a month and discuss the papers presented at the parent institute or other subjects. Every monthly meeting is accompanied by a luncheon, a banquet being served once a year. So far only Phelps Dodge men attend.

On the second day W. C. Holman, in the absence of Scott Dupont, general underground superintendent, Stag Cañon Branch, Phelps Dodge Corporation, read a paper on the experiments made in the operation of long faces. The experiments covered: (1) Mining back a 250-ft. face by loading into cars on a track constructed along that face. (2) Extracting three pillars giving a combined and almost continuous face of 210 ft., using 20-ft. portable belt conveyors for the transference of the coal. (3) Using similar conveyors on a four V-panel system. (4) Forming a 450-ft. face from the end of three roadways 290 ft. long and using portable conveyors to bring the coal from either side to a shaking conveyor.

Mr. Dupont was disposed to believe that too rapid a retreat could be made. Most persons declare that no retreat can be too rapid, but Mr. Dupont thinks that for any given condition a certain speed is better than any other. He has found four lines of props desirable as a break row. They are more easily removed than cribs. In his belief, it is important to clean up the coal closely as the face advances and it is well to reduce as far as may be the area that must be supported adjacent to the advancing face.

Water in a Dry Land

Most of us think of the West as a region that is at least semi-arid. This is a view of the water garden adjacent to the hotel where the Rocky Mountain Coal Mining Institute held its technical sessions. Man's ingenuity and the power derived from coal can turn even the desert places of the earth into bowers.

W. C. Bracewell, state mine inspector, Albuquerque, N. M., read the recommendations of the Safety Committee. William Monay said he was opposed to any action on these recommendations as many mine officials, representing the largest companies in Wyoming and Utah, were not present. However, some of the recommendations were adopted and some were slightly changed. Mr. Monay strongly objected to the requirements that the trolley wire should be set 6 in. to the outside of the track, saying that in pitching places the miners traveled on the side of the track and not in the center of the road.

Mr. Littlejohn stated that this provision was based on mines where the men traveled the center of the track. It also took cognizance of the fact that the trolley pole was usually set that far out. Most entries are on the strike and level and in them the men walked in the center of the track and not at the side or along the rib.

Section II sets forth that "500 volts direct-current should not be allowed in any installation." No one objected to this being made the rule for new mines, but some thought this too strict for plants already having 500-volt equipment or at new developments where machinery was transferred from older plants. It was said that in Illinois the electrical pressure allowed by law was 600 volts, though 250 volts normal was general throughout the field.

This section was referred back to the Safety Committee, but the second clause—"Trolley wires should not carry a voltage of more than 250 direct-current"—was approved. It was urged as against this provision that where 250 volts was the desired pressure at the machine or locomotive, 275 volts was the potential at the point of generation, and that voltages between that and 250 should be the potential of the trolley wires and feeders. Consequently it was agreed to add to the words "250 volts direct current" the notation "nominal voltage."

The requirement that where alternating-current power is used the voltage should not exceed 220 where the units are small, but might be 2,200 volts where the units are large, provided the power cables are of armored construction and safely buried at all crossings, on haulageways and where men travel, was approved.

Section IV, requiring that "where power lines pass through door frames or stoppings they shall be properly insulated with porcelain, compound or rubber tubing," was also approved—the word "compound" being added at Mr. Monay's suggestion.

The recommendation that "wherever men get on or off mantrips in the vicinity of trolley wires the latter should be well guarded and should also be protected with a cutout switch which must be pulled before the men are allowed to get on or off trips" was adopted without modification.

Section V stated that "All mines showing traces of explosive gas should be termed 'gaseous mines' and only electric cap lamps and permissible powder should be used." John Dalrymple, chief state mine inspector of Colorado, in a letter to the secretary, desired that this be modified by inserting the words, "by chemical analysis" after the word "showing." E. H. Denny of the U. S. Bureau of Mines said that the meaning of "traces" was ambiguous. Did it mean chemical traces or traces as determined by the flame safety lamp? William Littlejohn declared it meant safety lamp traces.

Mr. Denny then stated that Mr. Dalrymple doubtless had in mind a few hundredths of a per cent of methane in the return. Mr. Dalrymple believed that other mines might have a similar condition and that any mine show-

ing even a trace of gas should have full protection. H. I Smith, of U. S. Geological Survey, said that the Mine Safety Board was preparing to recommend that mines be divided into three classes—gaseous, medium-gaseous and non-gaseous.

One of the members believed that the operator should be allowed to use black powder, if he fired his shots when all the men were out of the mine. Mining laws were intended to protect life and limb and not the operator's property. If he preferred to use black powder and did it without jeopardizing the life of any one it seemed absurd to make a ruling that compelled him to follow a line of conduct that he did not believe profitable. Mr. Moses also opposed this section. As a result of the criticism and the many objections to the recommendation it was referred back to the committee.

Section VII opens with the words: "Before flame safety lamps are given out they shall be carefully inspected by a competent man." Hugh MacLeod, state inspector of Wyoming, said that lamp examiners and cleaners should be both qualified and certified. They had only too often been neither one nor the other.

Other provisions in the section are "All employees who are charged with the carrying of a flame safety lamp should readily submit these lamps for inspection to either state or company mine inspectors. If more than one gas inspector is employed in any mine they shall submit their lamps to each other for inspection. All such employees using the flame safety lamp should use the permissible type, magnetically locked. They should be the property of the company and the latter should maintain them." The words "magnetically locked" were inserted at the suggestion of E. H. Denny, who stated that the U. S. Bureau of Mines had in 1912 approved a certain type of key-locked lamp that is still in the field and being used. The Bureau had since recognized the importance of having all lamps magnetically locked.

Section VIII was to the effect that "no fan should be reversed if there is any danger of explosive gas being pulled over a fire. Ventilation should be so arranged that fresh air only will pass over the fires." Mr. Monay objected that every fire had to be dealt with according to mine conditions. General instructions were dangerous and then, moreover, "Who was there who wanted to draw explosive gas over a fire?" So this section was referred back to the committee.

Better treatment was given Section XIV, the next on the list, a number of sections having apparently been eliminated at previous sessions. "As soon," says this section, "as the machine cuttings are loaded out the working faces should be sprinkled. This sprinkling should be done before the coal is shot down. Wherever practicable water should be applied to both the intake and return side of the cutter chain." It was explained that the water sprinkled on one side of the chain often failed to wet the dust entirely down, with the result that it was raised on the return side. Some urged that in that case the quantity of water poured on the entering chain should be increased. Mr. Littlejohn said that the return side of the chain frequently raised much dust. Consequently the recommendation was approved.

Section XIX, the next to be discussed, states that "roof, timbers and ribs (presumably of haulageways) should be thoroughly rock-dusted and the floor sprinkled with water. Rock-dust barriers should be installed at intervals of 1,000 ft. in entries, manways, aircourses, slopes, etc., and at the junction of both entries and panel planes, with main entries, and they should be kept filled at all times with a dust that will show a fineness of at least 70 per cent through a 200-mesh screen. Main slopes, manways, main aircourses and entries should be liberally rock-dusted."

Mr. Holman said that some reference should be made to the necessity for sampling the dust periodically. The Phelps Dodge Corporation, Stag Cañon Branch, does this every 60 days. The roadways must have over 70 per cent of incombustible dust. Mr. Denny stated that the U. S. Bureau of Mines had found that the dust on the roof and ribs did not have a sufficient extinctive ability where the floor was sprinkled with coal dust.

Some mines found it difficult to keep the incombustible dust on the floor sufficiently thick to constitute 70 per cent of the whole. Leaky endgates and loose topping soon covered the floor of the mine with quantities of highly combustible dust. This was the reason for sprinkling. Mr. Holman said that by mixing incombustible dust and coal dust in various proportions and then blowing the mixture in a cloud it was possible to test its incombustibility by attempting to ignite the cloud with a piece of burning waste.

A number of other recommendations forming Sections XXII and XXXVIII (a) to (g) were approved but the recommendation that "a box of dry sand be kept at all electrical stations" was modified by adding "or fine incombustible dust" after the word "sand." Another change was that made in the clause requiring "uninsulated power lines shall not be allowed in the vicinity of working faces; no open switches should be allowed; no power lines should lead into room or entries beyond the last crosscut, and inclosed connectors should be used instead of open nips for mining machine cable connections to power lines, etc."

A change was made on protest that this rule would prevent reel gathering locomotives and mining machines being operated beyond the last crosscut. "No power lines" was made to read "No permanent power or trolley lines." Mr. Monay wanted to know if there were any closed nips for mining-machine cable. In reply J. T. Ryan stated that only one had been approved by the Bureau of Mines. Mr. Monay objected to the cost of such an installation, especially as the nip was located where trolley locomotives might be expected to be throwing off a rain of sparks quite capable of igniting gas. This clause was accordingly referred back to the committee.

The following provisions were also returned to the safety committee for further consideration: "All trolley wires should be protected where less than 6 ft. above the rail even if the voltage is as low as 250."

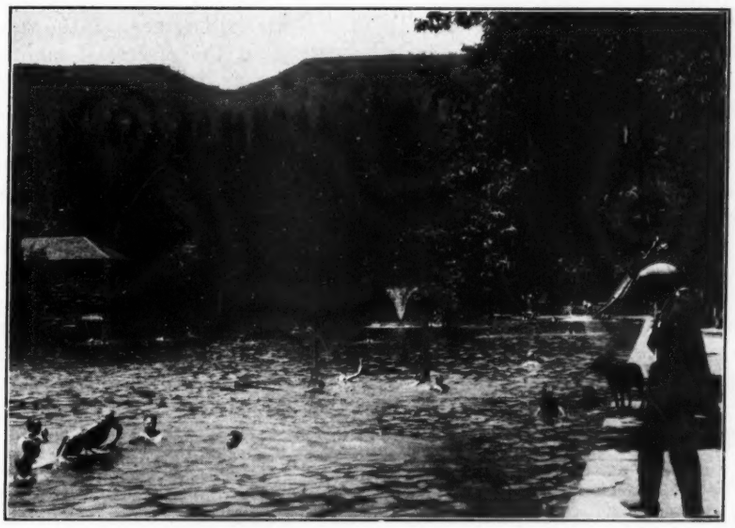
BOTH THE CUTTING and return sides of the cutter chain on a mining machine should be sprinkled, according to the Safety Committee. Water poured upon only one side of the chain appears incapable of completely allaying the dust made in mining. This unwetted dust naturally rises into the air and constitutes a well-known hazard. Sprinkling of the cutter chain has long been practiced and although it aids greatly in allaying dust, it would appear to be not entirely effective.

Many other recommendations were made by this committee, all of which are worthy of careful study by mining men.

"No open lights shall be allowed in any coal mines where indications of explosive gases have been observed." "A flame safety lamp should not be placed in the hands of any person unless he has a certificate of competency in its use."

Some objected to the requirement that, "Dynamite should not be allowed in any coal mine as there is a sufficient number of permissible powders manufactured that will perform any work done by dynamite and certainly with a greater degree of safety." They questioned whether the permissible powders could perform the work done by dynamite. Mr. Denny stated that the number of gas explosions resulting from the blasting of rock by dynamite justified excluding that explosive from the mines. Mr. Stout, of the Colorado Fuel & Iron Co., said that his company had been driving many rock tunnels with permissible powders and had found the work satisfactory. Mr. Moses said that the Gallup American Coal Co. had driven 800 ft. of rock tunnel with permissibles and had been entirely satisfied with their performance.

In the afternoon, Mr. Littlejohn replaced Mr. Moses as chairman, and S. W. Farnham read a paper on "Late Developments in Mechanical Loading." He stated that in some thick, level coals where little timbering is needed shovel-type loaders are producing in standard room-and-pillar mining from 18 to 40 tons per man employed, including in the designation of "men employed" all those who do the tracklaying, timbering, drilling, shooting, undercutting and switching in connection with the operation of the shovel.



Swimming Pool at Glenwood Springs

The water's always fine. It's the coming out into the chill of September that calls for courage, but as will be noticed the bath house is handy to the swimming hole.

With similar methods of figuring, the output per man employed would be from 18 to 28 tons with the dragline scraper of high horse power and large capacity. With the small-sized scrapers with motors of from 25 to 35 hp., 22 tons per man employed can be obtained. A recent installation in central Pennsylvania operating in 4 ft. coal on two 75-ft. adjacent faces enabled four men on the day shift and three on the night shift (a total of seven) to average 22 tons for the first half of August.

Mr. Farnham said, "It is a generally accepted fact that experience with hand-loaded conveyors at the face has shown that the output for all men employed cannot be increased to a figure that is competitive with some other systems of loading. Only where special factors enter in can they hope to continue against such competition."

With the duckbill loader, four men working nine hours, said Mr. Farnham, made a record of six cuts, loading out all the coal. The entry was advanced 40 ft. This, however, could not be regarded in any way as an average performance. A scraper loader with a three-drum hoist of 35 hp. has advanced a 12-ft. entry an average of 22 ft. per shift for 12 consecutive shifts. Mr. Farnham added that the ability to advance narrow work rapidly is more important than the cost of operation.

He stated further that it was not necessary to employ two gathering locomotives per shovel. "Operations have been planned where five locomotives have been arranged to take care of four shovels, the locomotives being located so that one with a train of empties coming from the main siding would travel to one shovel where the trip was about loaded and would immediately start serving it. Meanwhile the locomotive that had previously been serving the shovel would haul the loaded trip to the main locomotive siding and take a trip of empties to the next shovel to be served with cars. Rotating in this way, five locomotives can serve four shovels without delay if the mine is systematically arranged.

Increased tonnage per machine has been attained at one mine by increasing the undercut from 7½ to 9 ft. By shearing at each rib the hanging of loose coal at the corners of the room has been prevented. Mr. Farnham claimed that mechanical loading had improved the size and appearance of lump coal by producing large lumps, making the separation of slate or partings easier than if the material were shot fine and a large number of small pieces had to be separated. The power shovel loader by its ability to lift and handle large pieces without appreciable tearing, grinding or cutting, produced large and clean lumps. As he explained later, the scraper might and doubtless did break up the coal somewhat but not as much as the miner does when he finds a two-man lump and wants to get the coal in it onto the car. The two-man lump can be readily handled by a power shovel or a scraper. There is no occasion to break it.

The shaker conveyor loader and the dragline scraper depend for their rapid advance on shooting the coal several times per shift. As the law in some states permits the coal to be shot only once a day these devices could only advance the entries about 7 ft. per shift. In such states the McKinlay loader has the advantage, for it does not depend on shooting but advances by cutting the coal mechanically.

In discussion Mr. Farnham said that as much as 21 tons had been loaded in 16 min. with a shaking-conveyor loader, but at the end of that time, of course, the regular adjustments were needed, delaying further progress. He added that the new methods of entry driving to which reference had been made were adopted in Utah where shots can be fired only when all men are out of the mine. He said further that, especially in the low places, the miner was disposed to break the coal down unduly. With machine loading the company does

its own shooting and surely ought to do the work in a manner that will produce the largest coal possible. In one mine in Illinois the depth of the undercut has been increased to 10 ft.

D. W. Rocky, of the vocational service station at Santa Fe, N. M., spoke on the need for such instruction in the mines as had been shown necessary by the discussion. He stated that ordinarily the assistant foreman had 60 to 70 men under him. He could not give adequate instructions to anything like that number. Mr. Rocky called on Mr. Holman to describe the underground school at Dawson, N. M. A certain section of the mine was here set aside for green men where as a rule from 10 to 15 work under a special foreman who gives them definite instructions as to their duties. These men are paid according to their tonnage at the regular tonnage rate. The men liked the arrangement so well that many of them objected to being sent to some other part of the mine on graduation.

EDUCATION COMMITTEE RECALLED

Mr. Rocky said that state and federal aid could be obtained for the establishment of such underground schools, and added that he wanted this work to have the guidance and direction of the Education Committee of the Institute and suggested that this committee, which had not been discharged but had become inactive, be made permanent and charged to look into the Dawson underground school plan, reporting back at the next meeting. Put in the form of a resolution this suggestion was accepted by the Institute. Mr. Rocky believed that each mining school should have an instructor, chosen from the men at the mine, so that impracticable suggestions that could not be accepted or practiced would not be made by them.

Mr. Emrick said that in Routt County, Colorado, one company examines the payroll, and those men who fail to average up with their fellows are given special instruction to enable them to do better.

A letter from Dan Harrington to the secretary of the Institute was then read. Mr. Harrington set forth the fact that in all the general divisions of accident, the Rocky Mountain states held an unenviable record. This surprised many of the members, especially the representatives of the Mutual Insurance Co. The figures given were for fatalities per thousand employed. W. D. Ryan made an appeal for greater activity in safety extension work, especially in co-operation with the Joseph A. Holmes Safety Association.

CONSERVATION IS PRACTICED AT ALAMO

On the last day of the meeting, Sept. 11, with Mr. Moses in the chair, I. M. Charles read a paper on "Washing Domestic Coal at Alamo." At this mine the nut coal, which is the size that contains most of the impurity, is jigged. The coal resting against the outside walls of the receiving bin sometimes freezes to a certain thickness after the washing, thus insulating the rest of the bin's contents.

One man runs the washery, which uses from 75 to 100 gal. of make-up water per ton of raw nut. With economy in collecting the water from the bins and sludge a smaller quantity of water would be consumed. The water is not corrosive. Mr. Stout of the Colorado Fuel & Iron Co. said that the water from the Colorado mines was remarkably free of corrosive qualities and could be used quite satisfactorily without treatment in the boilers at the mine plants. The small sizes of coal from the Alamo mine are used largely by the cement works. The refuse from the washery is used in the power plant. The general practice was to make three sizes of coal: Over 3-in.; 3-in. to 1¼-in. round; and coarse slack. Sometimes pea is separated from the slack, but not usually.

HIGH-ASH DUST MEETS READY SALE

Mr. Littlejohn described the washery of the Bellingham Coal Co., in Washington. The dust from this plant seems to average about 50 per cent sand, but it is sold readily to cement manufacturers for powdered fuel, the sand becoming part of the product. The Mendota Coal Co., at Centralia, Wash., dumps its coal into a big vat and without any stirring or disturbance by jets of water obtains a good separation. Only one man is employed in the washery. The coal is ultimately screened into 3 to 1¼-in.; 1¼ to ⅝-in. and 10 mesh (buckwheat). The cost of the washing amounts to about 1⅛ c. per ton.

In an impromptu round table G. W. Robinson pleaded for better recognition of the electrical engineer. Mr. Moses declared that mine managers and foremen gave the electrical engineer all the support he required. Some urged that the electrical man at the mines who complained was trying to "pass the buck" for his own shortcomings. Others regarded the complaint concerning lack of support and authority as quite general and justifiable. The electrical engineer could do everything to make the mine a model of electrical safety and efficiency except to hire men to install the equipment and maintain it or to buy the equipment that he needed to make the mine safe and efficient. Mr. Littlejohn said that in Great Britain as soon as a wire went into a mine an electrical engineer had to be engaged and, subject to the law and the state inspectorate, he had full control of all electrical equipment.

Air Cleaners Soon Pay for Themselves

If an industrial gasoline engine is operating under dusty conditions, some provision should be made for cleaning the air that enters it through the carburetor. Air cleaners will pay for themselves by reducing the up-keep cost of the engine. They will keep down repair bills, thus saving real dollars and cents.

As is well known, the carburetor mixes gasoline and air in correct proportions. This mixture is conducted into the cylinders where it is exploded. If it contains dust these particles of foreign matter work their way around the pistons and rings acting as an abrasive so that excessive wear results.

Dirt also works down into the oil sump where it mixes with the lubricant and sludge forms in the oil pan. This thick, heavy mass collects around the oil strainer, clogging it and retarding the flow through the lubricating system. Sometimes it so decreases the movement of oil that the bearings are not properly lubricated, with the result that they heat, score and sometimes burn out.

It will thus be seen that dust has a disastrous effect on the engine as a whole—not one part but all are affected. Repair bills grow excessive and the engine becomes an expense rather than an investment. A number of good air cleaners are on the market and the manufacturer of the gasoline engine used will gladly make recommendations concerning a choice between them.

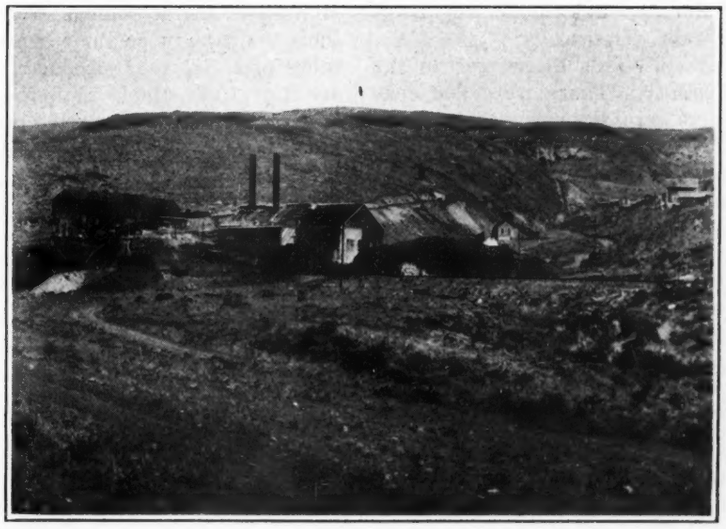
Montana's Coal Exceeds That of Any Other State

At Present Rate of Mining Would Last for Nine Hundred Centuries, Over Half Its Counties Producing Coal—Most of the Beds Are Lignite, But Much Is Higher Quality—Some Is Coking Coal

By J. P. Rowe
Professor of Geology, University of Montana, Missoula, Mont.

THIRTY-ONE STATES in the Union contain coal or lignite in varying quantity, but Montana has more square miles of known coal fields than any other. Illinois comes second. According to the estimate of M. R. Campbell, of the U. S. Geological Survey, in "Coal Resources of the World," published in 1913, Montana has 38,525 square miles of known coal fields and 1,007 square miles more that may be and probably are, underlain with workable coal. Campbell estimates the original tonnage of coal and lignite in Montana as 380,424,000,000 tons. At the present rate of production, the coal in Montana would last for many centuries. However, the best is being mined first. As a result, that now being extracted, aggregating about 4,000,000 tons per year, is largely sub-bituminous and bituminous. The lignite which is present in by far the largest quantity is mined only in a small way, because it disintegrates if shipped any great distance.

Probably Colonel James D. Chestnut was the first to discover coal land in Montana. This was back in 1867. Later the coal on the property thus discovered was mined, and a small town sprung up known as Chestnut. This is located between Bozeman and Livingston on the main line of the Northern Pacific R.R., near the top of the divide. The mine was worked for many years, but because the bed was badly faulted, it was abandoned a short time ago.



Bear Creek Mine of International Coal Co.

This mine is in the Rocky Fork field that produces in normal years more coal than any other in the state of Montana. The seam dips 5 or 6 deg. This field is in Carbon County and near the Clark fork of the Yellowstone River.

The commercial coal and lignite deposits in Montana are found almost entirely in the Kootenai, Lance or Laramie and the Fort Union formations. There are many different fields in Montana, but for convenience fifteen fairly well-known regions may be listed. In all of these some kind of coal or lignite has been, or is now being, mined in commercial quantities.

These are as follows: 1. Plains region; 2. Bull Mountain field; 3. Clark Fork of Yellowstone field; 4. Rocky Fork field; 5. Yellowstone field; 6. Trail Creek field; 7. Cinnabar field; 8. West Gallatin field; 9. Toston area and an area near Lombard; 10 Ruby Valley field; 11. Belt or Great Falls field; 12. Flathead field; 13. Sweet Grass Hills and Havre fields or Assiniboine region; 14. Judith Basin field; 15. Tertiary Lake beds area. The following is a brief description of each of these fields:

Plains Region—This may be regarded, in a way, as a continuation of the North Dakota lignite area. The fuel in this section is largely lignite. Most, if not all the counties in the eastern third of the state have workable deposits of lignite, which is the type of coal that is found in this region. The beds are quite flat, and the lignite is often near enough to the surface so that mining is not difficult. Some of the beds are 30 ft. thick. Mines in Custer, Dawson, Wibaux, Sheridan, Valley, Rosebud and other eastern counties are now being worked and have been for some time. The product is seldom if ever shipped by rail, as it weathers too freely. As the lignite covers a wide area all incentive to ship the fuel from place to place is lacking.

Bull Mountain Field—This field is in Musselshell and Yellowstone counties. One bed in this field is nearly 20 ft. thick. Though it does not cover a large area, the estimated reserve is nearly 5,000,000,000 tons. The beds are quite flat. The upper part of the Fort Union formation occupies all of the center of the Bull Mountain region and contains the principal coal beds. Coal is now being worked near the city of Roundup. In fact, this city was built and subsists largely on the coal mining payroll, the Chicago, Milwaukee & St. Paul R.R. Co. owning and operating large mines near Roundup.

Clark Fork of Yellowstone Field—This is rather a large region although it has not been worked to any extent except in Carbon County at Bridger, Bego, Fromberg, etc. The coal is flat and its thickness varies from 5 to 7 ft.

Rocky Ford Field—This includes the mines at Red Lodge and at Bear Creek. It usually produces more coal than any other region in the state. One of the largest coal mines in Montana is owned and operated by the Northwestern Improvement Co., a subsidiary of the Northern Pacific Ry., at Red Lodge. There are several beds of good coal in this field amounting in the

aggregate to about 80 ft. of solid coal. There are five or six large producing mines at Bear Creek where the seam dips at only 5 or 6 deg. To the south, at Red Lodge the coal is at an inclination of about 18 deg. The beds in this district are in the Fort Union formation.

Yellowstone Field—This area lies almost wholly in Gallatin and Park counties. The coal bed has been worked for a long time, especially at Chestnut, Cokedale, Mountainside, Timberline and Storrs. There is little activity in this field at present, owing to the difficulty of mining in ground so greatly faulted.

Trail Creek Field—The beds of this field that have been worked are only about ten miles from Chestnut. The coal is a good grade of sub-bituminous fuel, but the beds are thin and rather badly broken. Little, if anything, is being done at present to develop this region. At one time the Hoffman, the Kountz, and the Maxey Bros. mine were operated in this district.

Cinnabar or Electric Field—This district is in the southern part of Park county. There were 200 coke ovens in operation at Storrs several years ago, but they are now abandoned, and the field is not being worked.

West Gallatin Field—This area, which is not large, is located in Gallatin and Madison counties. Little is being done here at present because the coal is too far from a railroad.

Toston Area and Area Near Lombard—The coal in these fields is badly faulted, and none is being mined.

Ruby Valley Field—This lies about 30 miles west of the West Gallatin field. Little prospecting has been done, and no commercial mines are in operation.

Belt or Great Falls Field—The coal in this field is the lowest geologically and is therefore the oldest coal commercially operated in Montana. This field includes Teton, Lewis & Clark and Cascade counties.

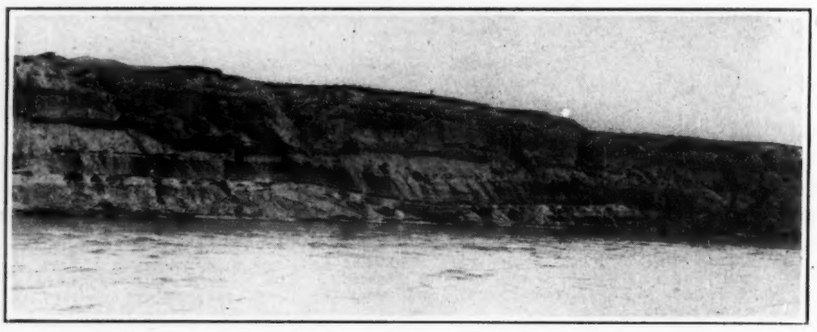
The thickest bed of coal lies in Cascade county in and around Sand Coulee. Some of this coal will coke, and several years ago there were one hundred active coke ovens at Belt. There are several mines in this field, the most active and the largest being in the neighborhood of Sand Coulee and Stockett. Some years ago, a few mines were in operation near the mouth of Hound Creek, but this area is too far from a railroad for active operation.

Original Tonnage of Montana Fields

As estimated by M. R. Campbell

Field	Area in Square Miles Known	Area in Square Miles Possible	Lignite Metric Tons	Sub-bituminous Metric Tons	Bituminous Metric Tons
Fort Union	33,132		331,646,700,000		
Bull Mountain	633	457		4,353,100,000	
Assiniboine	3,000			2,722,300,000	
Judith Basin	1,500				1,814,900,000
Mountain	10	100		90,700,000	
Flathead River	150			3,081,700,000	
Yellowstone	50				42,900,000
Red Lodge-Bridger	50	450		1,535,200,000	552,500,000
Total	38,525	1,007	331,646,700,000	11,783,000,000	2,410,300,000

A metric ton is 2,204 pounds.



Coal Outcrop near Miles City on Yellowstone River Bank

This, like the Sand Creek outcrop, is in the plains region. It is located in Custer County. The Yellowstone heads up in the Park of the same name and goes on a diagonal line though with some deviations across the south-east corner of the state. Custer is to the east of Rosebud County where lies the big stripping operation of Colstrip, a property of the Northern Pacific Ry.

Flathead Field—There are three rather distinctly marked areas in this region. They are the North Fork, Middle Fork and South Fork. It is reported that the coal there found is lignite to sub-bituminous, and according to Campbell there is a considerable quantity of it.

Sweetgrass Hills and Havre Fields or Assiniboine Region—Campbell says these fields have 3,000 square miles of coal and over 3,000,000,000 tons. Though some investigators have declared the coal sub-bituminous, a large part of it is lignitic, and so far it has not been developed to any large extent.

Judith Basin Field—This district lies in Judith Basin and Fergus counties. Coal has been mined in this field for some time, although at present the production is not large.

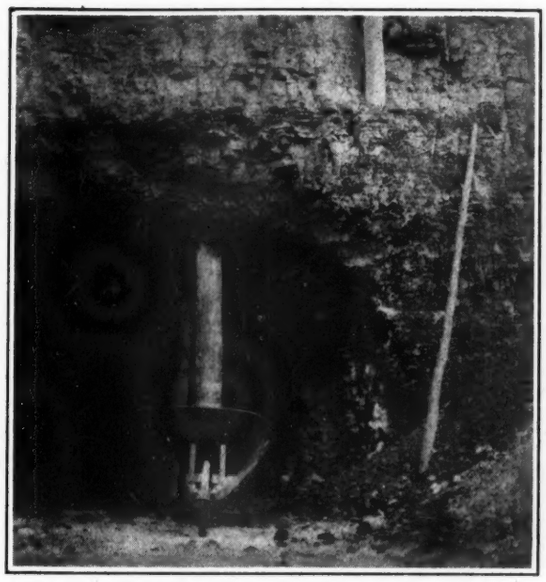
Tertiary Lake Beds—Lignite is scattered quite generally throughout the intermontane valleys of western Montana. These valleys were old lake beds, and on their margins or in their shallow edges grew the vegetable material that produced the lignite. Some beds are 8 or 10 ft. thick. For the most part, however, the coal is high in ash. Attempts to work these deposits have been made near Drummond, Granite County; near Darby, Ravalli County; near Missoula, Missoula County and elsewhere. The results have so far not been entirely satisfactory.

Coking—For a number of years beehive coke ovens were erected at several localities in the state, and in these the coking qualities of the coal of Montana were well tested. In all there have been 629 ovens either built or partially built within the state. They were located as follows: Belt, 100; Horr, now Electric, 220 (worked for some time); Cokedale, 100; and Storrs 100 finished and worked and 100 never completed. At Lombard, 9 were worked for a short time. At present not a coke oven in the state produces coke from Montana coal.

According to J. W. Walker, Chairman of the State Board of Equalization, "the total production of coal in the State of Montana for the year 1925 was 2,900,470 tons. The average value of this coal at the mine, which is the cost of production, is about $3 per ton, making the value of the coal mined in the state during 1925 $9,028,410. There are 282 concerns that mine coal in the state, and 90 per cent of it is produced by nine

large companies, and the other 10 per cent by 273 small operators whose output ranges from 10 to 100 tons each." The following twenty-seven counties produced more or less coal during the year 1925: Blaine, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fergus, Gallatin, Earfield, Golden Valley, Judith Basin, Hill, McCone, Musselshell, Missoula, Pondera, Powder River, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Toole, Valley and Wibaux.

What other state in the union can show over 50 per cent of its counties yielding coal or lignite in commercial quantities? All but five or six counties in Montana contain coal or lignite in workable amounts. To be sure, some of the western counties have extremely limited areas, but nevertheless the fuel has been mined and used.



Sand Creek Mine of the Powder River Co.

This mine is on Sand Creek, a branch of the Missouri River, in the north of the state and in the county of McCone. Only part of the thick, 22-ft. seam is shown in the illustration.

Leasing Coal Lands—Some years ago Federal coal lands were acquired in much the same manner as a homestead, 160 acres to each person. If the land was 15 miles or more from a railroad, it cost $10 per acre; but if it was less than 15 miles the price was $20 per acre. The Federal practice was then changed, and coal lands were sold on a valuation based on coal thickness. In Montana the price was $10 per acre foot of coal for one bed and $5 per acre foot if there were two or more.

The present practice is to lease on a combined rental and royalty basis. The United States will sell no more coal lands outright, but one may secure a permit to prospect for two years. One lease at a time may be obtained, in Montana, from the Department of the Interior, the area comprised being from 40 acres to as much as four sections. If the coal is worked out within three years, another lease may be obtained from the Department of the Interior.

Output at Nine Largest Mines in Montana

	Output, Tons
Carbon County	
Northwestern Improvement Co., Red Lodge	472,030
Montana Coal and Iron Co., Bear Creek	200,629
Anaconda Copper Mining Co., Washoe No. 2	178,412
Cascade County	
Cottonwood Coal Co., Stockett	252,533
Musselshell County	
Republic Coal Co., Klein	608,052
Roundup Coal Co., No. 3	235,904
Jeffries Coal Mining Co., Jeffries	23,491
Bair-Collins Co., Keen	90,749
Rosebud County	
Northwestern Improvement Co., Coalstrip	645,162
Total from the nine mines	2,706,962

The rental on leased coal land is 25c. per acre for the first year, 50c. per acre for the second, third, fourth and fifth years and $1 per acre thereafter until the lease is surrendered, whether coal is mined or not. The royalty is not less than 5c. per ton, but the rental is applied on its payment.

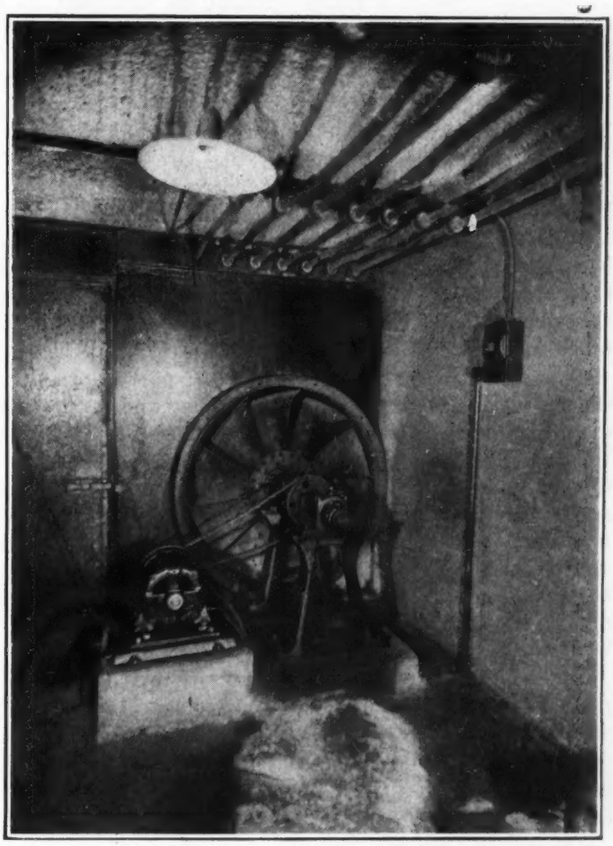
The U. S. Government will lease coal lands to a railroad company, one full lease for every 200 miles of steam-operated track in the state. This coal must be used for railroad purposes only.

Another form of coal lease is to cities and towns; 320 acres will be leased to a city of less than 100,000 population; 1,280 acres to one between 100,000 and 150,000 population; and a full lease of 2,560 acres to one of over 150,000 population. The city may sell the coal to its citizens, but without profit.

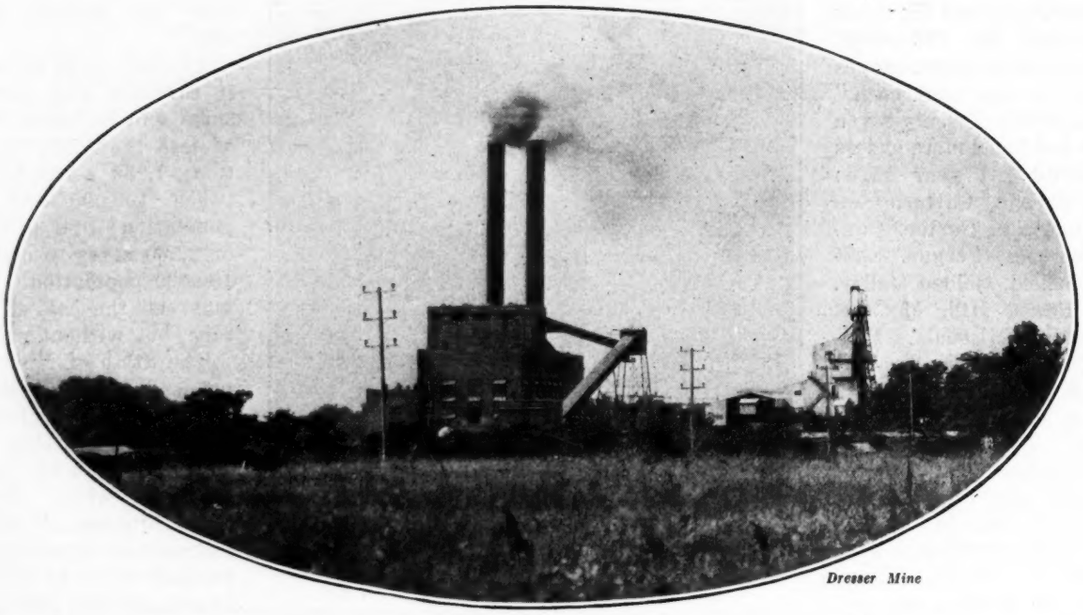
The State of Montana does not sell but will lease coal lands on a royalty basis. The royalty paid to the state is never less than 10c. per ton.

As a whole continental North America has been richly endowed by nature with solid mineral fuel. In this respect no area of equal size can exceed the wealth of Montana. It is probable that in the future means and methods will be perfected for producing smokeless fuels from her low-grade coals. This process will also doubtless result in a large recovery of valuable byproducts.

Keeping Underground Substation Cool



Mines may be cool, but a steady source of heat like the electrical equipment in a substation will slowly raise the wall temperatures so that a fan is needed to supply fresh air to the machinery. This illustration shows the substation in New Orient mine of the Chicago, Wilmington & Franklin Coal Co., West Frankfort, Ill.



Dresser Mine

Mine Will Extract Coal Under Wabash River And from Adjacent Land Areas

Coal of Three Owners Developed from Single Shaft—Though Shaft Is on River Bank It Was Sunk Without a Pump—Most of Output Will Be Burned at Mine Mouth

By Frank H. Kneeland
Associate Editor, *Coal Age*, New York City

NAMED AFTER the well-known actor and author of Indiana's state song, the Dresser Mine, of Walter Bledsoe & Co., of Terre Haute, Ind., has been sunk about seven miles in a bee-line almost due southwest of the courthouse in that city. It lies on a bend of the Wabash River about 2½ miles northeast of the point where that stream becomes the dividing line between Indiana and Illinois, and approximately two miles east from the western boundary of the state.

This operation is unique in several particulars. In the first place it will produce coal from the properties of three distinct owners—Walter Bledsoe & Co., the Indiana Electric Co., and the State of Indiana. Although no steamers of commercial size have plied this portion of the Wabash for many years, it was formerly navigated by commercial craft to a point some miles above Terre Haute. It is consequently considered to be legally, a navigable stream, and accordingly all mineral rights beneath it are the property of the commonwealth.

Second, it is expected that the major portion of this mine's output will be consumed as power fuel almost at the mine's mouth. It is not a "captive mine," yet for many years at least most of its product will go to a single concern. Nevertheless, ample provision has been made for careful preparation of the larger sizes of coal produced—which always commanded the best market price—and for meeting practically all market conditions. Both the bottom layout and the preparation equipment are so arranged as to afford great flexibility.

As may be seen in Fig. 1, the Bledsoe company owns the mineral rights under a small area on the west side of the river, although most of its holdings lie beyond the opposite bank. It will be further noted that, with the exception of a small "patch" of coal east of the river, the mineral belonging to the power company lies entirely on the west shore of the stream. The mine has been opened and the power plant built on land, the mineral rights of which have been leased to the Bledsoe people by the power company.

TRIBUTARY FIELD IS LARGE

In all, about 6,000 acres of coal is tributary, either actually or logically, to this mine opening and will doubtless be developed from its shaft. Of this, approximately 3,500 acres belongs to the Indiana Power Co., 1,300 acres to the Bledsoe company, while the rest is either under the river or consists of property the mineral rights to which have not been acquired by either company. Probably 95 per cent or more of the power company's coal lies west of the river; the Bledsoe company's property, on the other hand, is located approximately 20 per cent west of the stream and 80 per cent on its eastern shore.

At this operation the No. 5 bed of the Indiana series is the measure worked. It is reached by a main shaft

Headpiece shows a general view of the Dresser mine and power station. The mine tipple is at the right, the power plant in the center and the trees fringing the river at the left. The air shaft has been sunk at a point well to the right of the tipple and beyond the range of the camera. The wood-pole transmission line appearing in this picture leads to Terre Haute.

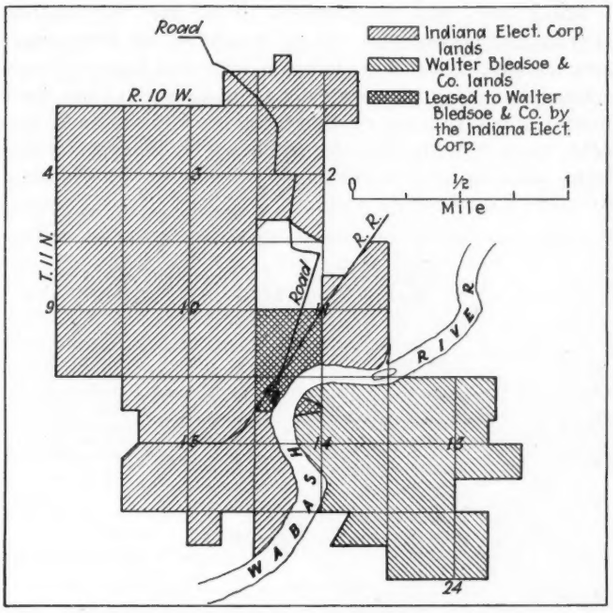


Fig. 1—Map of Properties Contiguous to Mine

The coal of three owners will be worked in this mine. Most of the property of the operating company lies on the east side of the river. Most of the power company's coal lies on the west bank, and the State of Indiana owns that under the stream bed. The territory belonging to the mining company and the state will be developed first.

11 ft. x 19 ft. 4 in. in the clear and 220 ft. deep. About 8 ft. of this depth is surface soil and glacial drift, the rest being rock formations of various kinds. At a depth of approximately 75 ft., the No. 6 coal bed is penetrated. In this locality this measure is about 4 ft. thick and of somewhat inferior quality. Approximately 27 ft. above the No. 5 coal bed, or 193 ft. from the surface, a thin vein of rider coal is also penetrated. Twelve feet of good roof rock overlies the main coal measure, and approximately 80 ft. of hard shale lies immediately above the rider.

ONE LITTLE PUMP IS SUFFICIENT

The shaft is concreted for a distance of 25 ft. downward from the surface and is lined in a similar manner from the bottom upward to a point 18 ft. above the top of the rail at the lower cage landing. Even though the shaft is located only a few hundred feet from the river bank, little water was encountered in sinking, so little in fact that a pump was not necessary, only one or two kibbles full of water being baled per day. At the present time all water made by this mine is drained to a sump beside the main shaft. This is connected with the shaft sump and from it the water is voided by a small electrically driven triplex plunger pump.

For a short distance on either side of the shaft bottom, the mine has been developed on the four-entry system. Main headings are being driven on the triple-entry plan, the center heading acting as a haulageway and being neutral, and the two side headings serving as intake and return, respectively. All panel and room headings will be driven double.

From the shaft bottom the main headings, as may be seen in Fig. 2, have been projected and driven in three directions—north, west and southeast. The north entries will develop the mining company's holdings to the west of the river and, later on, much of the power company's property. The west entries are intended to reach the main body of the power company's coal, and the southeast entries will reach that lying under the river and upon its farther bank. The west entries will not be driven to any length for a long time, and those extending to the north will not be pushed beyond the boundary of the Bledsoe coal for several years. This northern boundary of the mining company's property will not be reached for at least five years, and the coal belonging to the power company will not be developed for perhaps ten years.

The main headings extending to the southeast, run 1,200 ft. south 43 deg. east, then change direction to south 30 deg. east. This angle in the heading is a short distance from the east river bank. The mine, as projected, will be laid out in room panels 890 ft. long and 415 ft. wide. This will permit driving 30-ft. rooms on 45-ft. centers and leaving a 15-ft. pillar between room ends. This arrangement will give panels of 20 rooms each.

Heavy barriers will be left to protect all main headings. The first pillars between the double side headings are made 30 ft. long; the second pillars are 60 ft. in length. Seals will be placed against these second pillars after each section has been completed. This pillar arrangement not only affords an excellent anchorage or abutment to the seals, but furnishes adequate ventilation for them in case they might by any possibility leak.

Outside of the main bottom all main and cross entries will be driven 12 ft. wide on 35-ft. centers. Room entries probably will be driven 12 ft. wide on 28-ft. centers. This plan of mining contemplates no pillar

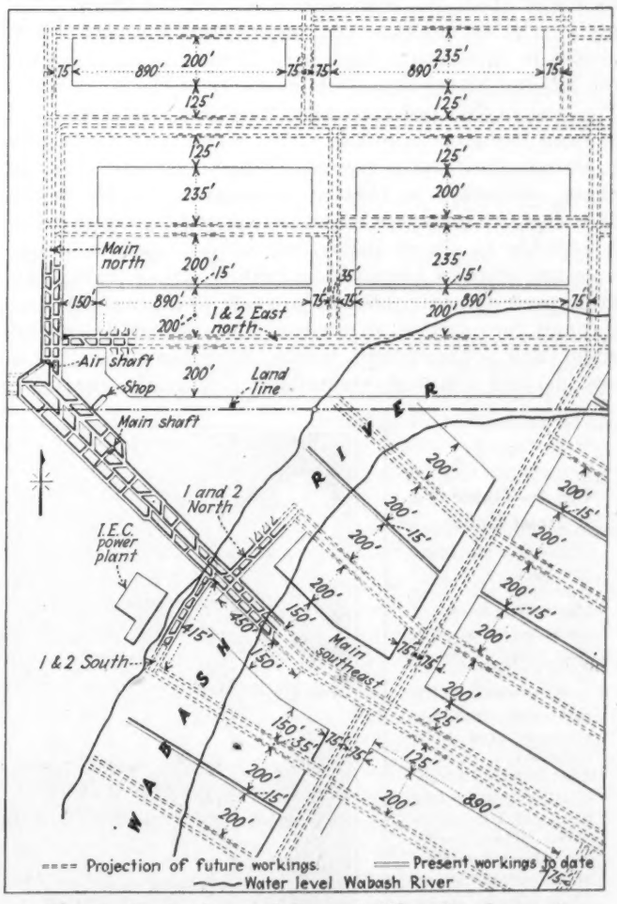


Fig. 2—Projection and Present Mine Development

From the main shaft three principal entry systems have been driven. These extend north, west and southeast respectively. Although adequate pillars are left and no attempt will be made at second mining, it is estimated that total extraction will exceed 60 per cent.

extraction, yet it is estimated that the total recovery will approximate 62 per cent.

As may be seen in Fig. 3, a two-track gravity bottom is provided. This bottom utilizes three of the four entries, only one of which is double-tracked. The grades, both above and below the shaft, are such as to make handling of the cars easy and rapid. The numerous diagonal crosscuts or shooflies will make it almost impossible for a haulage motor to be "caught" on the bottom. In other words, little time will be lost by a locomotive entering the bottom in any direction, for, upon arriving on one of the loaded tracks, it can uncouple from its trip, pass through a shoofly, pick up a trip of empties and proceed on its way. The grades in this bottom have been secured both by brushing top and lifting floor, but chiefly by the latter process. The coal in this bed is of almost uniform thickness and in most localities is nearly level Nevertheless in order to obtain the proper grades in this bottom it was, in places, necessary to take up as much as 3½ ft. of the floor rock. Crossovers on either side of the shaft make it possible to shunt loads from either track to either cage and empties from either cage to either track. All rails used on this bottom are of 40-lb. weight and through ties, 4x6 in. in section, long enough to extend under and support both tracks, have been used for a considerable distance upon either side of the shaft.

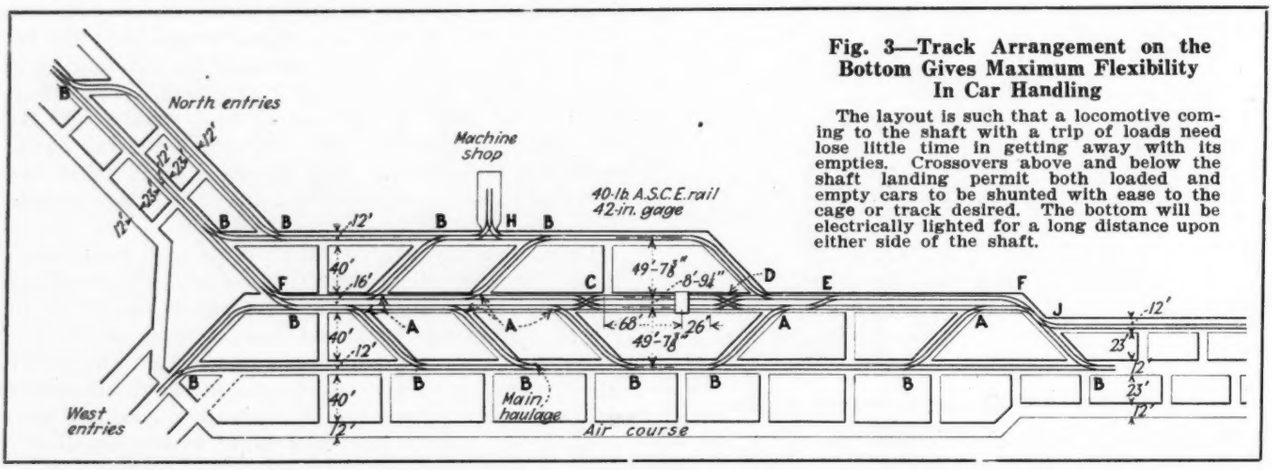


Fig. 3—Track Arrangement on the Bottom Gives Maximum Flexibility In Car Handling

The layout is such that a locomotive coming to the shaft with a trip of loads need lose little time in getting away with its empties. Crossovers above and below the shaft landing permit both loaded and empty cars to be shunted with ease to the cage or track desired. The bottom will be electrically lighted for a long distance upon either side of the shaft.

Much care has been taken to render this bottom thoroughly permanent. It is protected by three-piece sets, consisting of 5-in. H-beam legs and heavy I-beam collars spanning the entry. Cement grout has been placed above the top of these collars and rammed into firm contact with the roof rock. The bottom in this mine consists of a fairly hard, yet moderately yielding, fireclay; consequently where it has been lifted, concrete retaining or side walls have been built from the permanent floor to a point slightly above the bottom of the coal to prevent the sides from squeezing out into the entry. The legs of the three-piece sets rest upon these concrete walls. At the intersection of the shooflies with the main entries, heavy triangular concrete "noses" or columns have been built extending entirely to the roof. These are in contact with the coal upon one side and form an extension or protecting corner for the acute angles of the coal pillars. Heavy I-beams span the mouth of the shooflies, being supported at one end by this concrete column and on the other by a somewhat similar but rectangular pilaster built up from the concrete retaining wall to the roof. Retaining walls, "noses" and pilasters are all heavily reinforced.

Down the center of the heading and bolted to the steel roof supports, extends a 6-in. inverted channel iron. To this, conduit is attached by means of clips. This conduit is provided with porcelain light sockets at

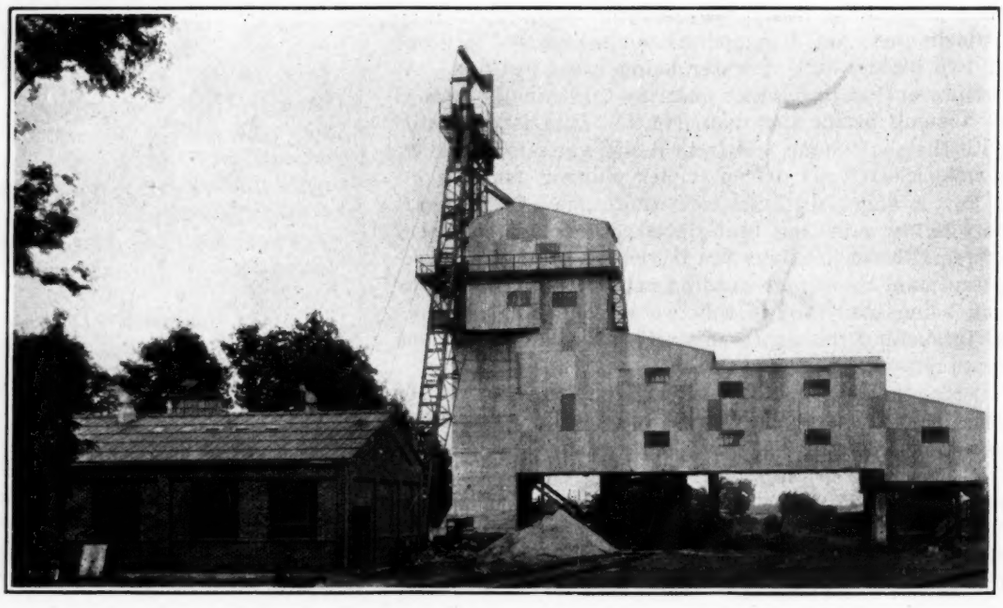


Fig. 4—Tipple and Hoist House

These buildings are assured of permanency, for they are constructed of durable material. The hoist house is of brick, roofed with cement tile, and the tipple is steel covered with corrugated zinc. The concrete lining of the shaft has been carried up on three sides nearly to the dumping point of the cars. This affords much stability to the headframe.

suitable intervals, into which 40-watt bulbs, protected by suitable wire baskets, will be screwed. The track for some distance upon either side of the shaft will thus be amply lighted.

The mine car used at this operation is provided with a solid steel body, no lifting endgate being used. This car is 26 in. high above the rail, 6 ft. wide and 8 ft. 10 in. long inside the box. It is fitted with tapered roller bearings, which take both radial and end thrust, and the wheels are covered with housings that project upward into the bottom of the car. Simple three-link couplings are provided. These cars are not as a rule heavily topped by the miners, although a little chunking is sometimes practiced. Overturning cages discharge the cars at the top of the tipple.

The tipple is a four-track steel structure, provided with reinforced-concrete floors and covered with corrugated zinc. The headframe is of the three-post type, with a single backbrace, the two sheaves at the top being carried in line on an A-frame. The reinforced-concrete lining of the shaft has been carried up upon three sides of the headframe to a height of 46 ft. or almost to the dumping point of the cars. A spillage plate, operated by the cage as it comes to dumping position, assures passage of the coal to the weight hopper and prevents either coal or rock from falling backward down the shaft.

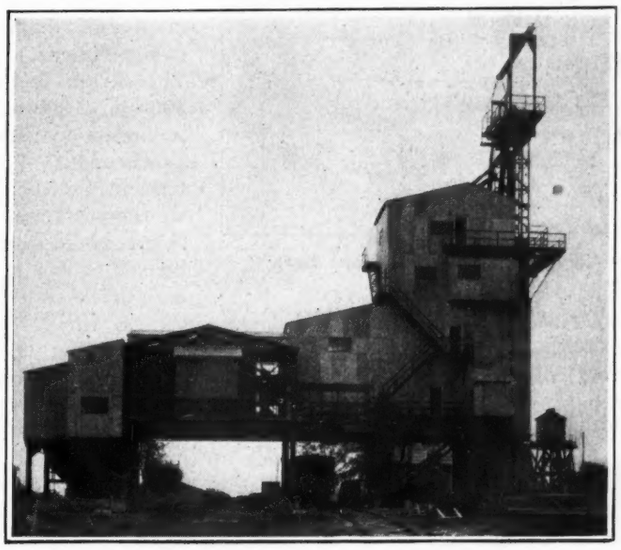


Fig. 5—Tipple Viewed from Loaded-Track Side

This is a four-track tipple, but as yet only one pair of rails is in place. Slack and nut will be shot into their respective cars, but lump and egg will be lowered by mens of loading booms. The end of the picking house has not yet been put in place. The frames for the apron picking tables can be plainly seen. Slate and refuse may be loaded either on the first track or be drawn off into dump cars from the slate hopper at the right.

Lighting in the tipple is both natural and artificial. The artificial light is furnished by a suitable number of skillfully placed incandescent lamps provided with reflectors. Natural lighting is from both windows and skylights. As employed in this tipple these latter differ somewhat from those usually found in structures of this kind. They are nothing more nor less than pieces of heavy wire glass about ⅛ in. thick made the exact size and shape of the corrugated roofing, the place of which they take. In other words, this glass is so laid as to overlap the roofing sheets below it and to be overlapped in its turn by the upper roofing sheets without the necessity for any metal frame or other auxiliary support. It therefore makes a cheap and efficient type of skylight.

Fig. 6—Low Steel Mine Car Is Used

This car stands only 26 in. high above the rail. It is fitted with roller bearings that will take both radial and end thrust. Note the hooks at the outer edges of the wheel housings. These make contact with the cage and prevent the car from falling out while being discharged.

After being dumped the coal slides into a weigh basket, by which, after weighing, it is discharged to the head of the shaking screens. These are of the pendulum-hung type and are crank-driven by single connecting rods from a shaking shaft located near their lower ends. They are built in two sections, each being balanced against the other. The power required for their operation is thus reduced to a minimum. At the present time, the entire output of this mine goes to the power plant of the Indiana Electric Co. and the shaking screens, accordingly, act as little more than conveyors, all but the smaller holes being covered with veil plates.

This tipple is designed, however, for an ultimate output of 2,500 tons per day and for the preparation and shipment of two sizes of domestic coal. Any combination of sizes may be likewise shipped. For this purpose, two picking tables terminating in loading booms will be installed shortly. These will make it possible to ship both picked lump and egg sizes of coal, or a mixture of these sizes. Provision has also been made for the shipment of slack or screenings. This size also may be mixed with the others and a picked run-of-mine shipped to the customer. It is the intention, however, that all screenings and small sizes, or those below 2 in., shall be delivered to the power plant.

These small sizes, or, at the present time all sizes, are passed to a 12x17-ft. Bradford breaker. This breaks down the larger pieces until they are suitable for stoker firing and rejects the rock, slate, tramp iron and other foreign material. This extraneous matter, together with the pickings from the tables, is delivered to a scraping conveyor, which discharges to the rock bin. After passing the breaker the stoker fuel is delivered to a belt conveyor, which extends through a concrete-lined, underground tunnel to the dump house of the power plant, where it discharges to the power company's belt conveyors which carry the coal to the bunkers in the generating plant.

Mention has already been made of the rock bin. This is a concrete structure, interposed between the discharge point of the mine car and the weigh hopper and capable of holding 50 tons or more of mine refuse. Means of controlling the rock and directing it to this bin are extremely interesting. The doors opening the rock chute and closing the weigh pan are operated electrically from the foot of the mine shaft, and the electric circuit performing this function is controlled by push buttons manipulated by the bottom cager. A double push button switch is provided for this purpose, with one pair

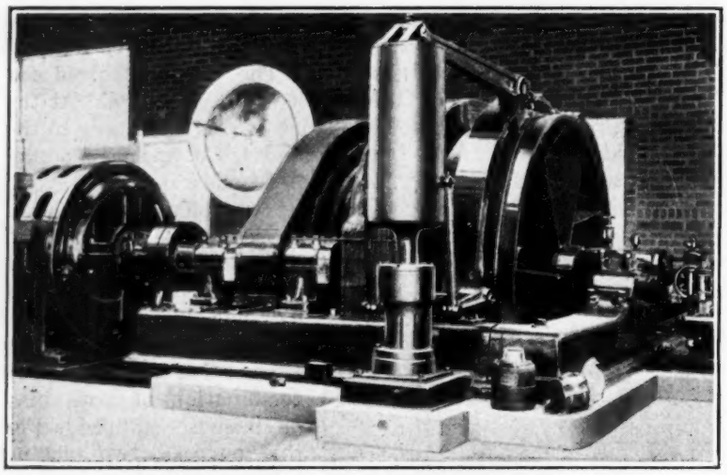


Fig. 7—Hoist Has Cylindro-Conical Drum Herringbone Back Geared to 400-hp. Induction Motor

Inasmuch as the shaft is only 220 ft. deep the cable makes but a few turns on the drum during a hoist. Heavy gravity-operated post brakes afford ample holding power when the machine is at rest. The platform for the hoist operative is elevated and directly in front of the drum, but cannot be seen as it is out of range of the camera.

of buttons for each compartment of the shaft; thus, there are four buttons in all.

Six or eight inches above this switch box, which is steel-incased and waterproof, is mounted a set of four light bulbs, the upper two being green and the lower pair being red. Under normal conditions, that is, when coal is being hoisted, the upper button of each pair is depressed, and the green light corresponding to it, burns. When a car of rock comes to the shaft and is loaded upon the cage, the lower button next to the compartment in which the car is caged, is pressed.

This makes the proper electrical connection at a motor in the tipple so that this machine is energized. Through suitable gearing and levers this motor then opens the door leading to the rock bin and closes the entrance to the weigh hopper. Simultaneously, the green light at the shaft bottom dies, and the red light burns. This places the dumping of rock under the absolute control of the bottom cager and makes him, and him alone, responsible for the proper manipulation of the rock gate. There can be no alibi.

From the rock bin the mine refuse may be drawn off either to wagons, trucks or dump cars. In most cases the cars are employed, as a ravine and flat near the tipple furnish an excellent dumping ground. By throwing a lever in the tipple, however, the rock may be diverted to a chute and loaded upon a railroad car on the slack track. Much of this refuse material weathers to a certain extent upon exposure to the air and is thus almost worthless for track ballast. It is probable, therefore, that the greater part of it will be dumped around the mine.

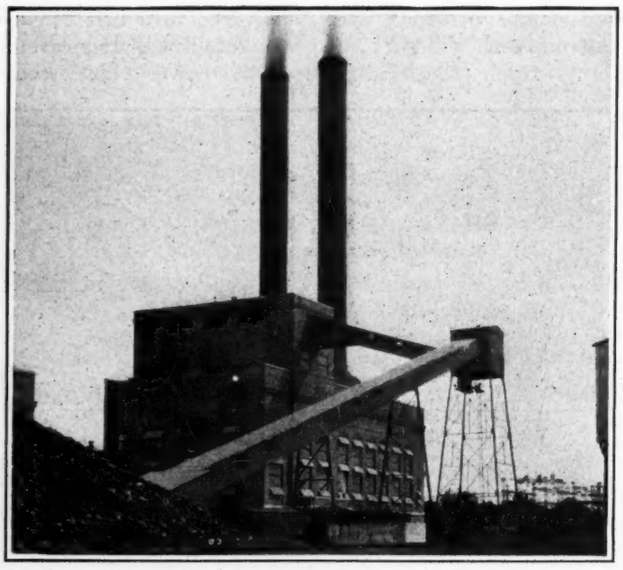


Fig. 8—Power Plant as Seen from Point Near Tipple

This shows part—and only a small part—of the fuel storage pile. The inclined belt conveyors by which coal is conveyed to the power plant bunkers appear in the foreground. The two stacks are each 17 ft. in diameter and 316 ft. high.

The hoist serving this shaft is fitted with gravity-operated and hydraulically released post brakes. Oil, employed to give the necessary hydraulic pressure, is pumped into a cylinder (thus raising a weighted piston) by means of a small electrically driven pump installed in the basement of the hoist house.

The drum of the hoist engine is cylindro-conical, 6 ft. in minimum diameter, 9 ft. in maximum diameter and about 4 ft. long between flanges. It is grooved for 1⅜-in. rope. This drum is herringbone back-geared to a 400-hp., 2,200-volt, 60-cycle, induction motor, having a continuous rating at 40 deg. C. A synchronous motor-generator set supplying current for the operation of the underground equipment, together with the necessary switchboard and other control devices, is also housed in this same building, which is of steel and brick construction and provided with a cement tile roof.

From the motor-generator set a 500,000-c.m. insulated cable leads down the shaft and feeds the positive side of the underground circuit. A cable of similar size and capacity, but uninsulated, leads back up the shaft and supplies a metallic return to this machine. This assures efficient haulage and cutting, at least until the remoter sections of the mine are reached, when it may become necessary to make provision for supplying current to the approximate center of load, by means of underground substations.

Current for operation of this entire plant is supplied by an individual power line from the generating station of the Indiana Electric Co. located only a few hundred feet away. This line is so short as to render power failure (because of line failure) almost out of the question. Aside from the hoist, all other surface equipment is operated by alternating current at 110 volts. All tipple motors are electrically interlocked so that the various pieces of equipment start or stop consecutively or in sequence. Thus, in starting the machinery, the conveyor delivering coal to the power company's conveyor would start first; then the Bradford breaker and, next, the shaking screens. In shutting down, this sequence is reversed. Push buttons, located at convenient points, in the conveyor tunnel control all operations, so that when one of these buttons is depressed the entire tipple is shut down. This is a safety feature of no mean importance.

This machinery eventually will also be similarly interlocked with that of the power company, so that any difficulty, failure, break-down or stoppage of the conveyor belts leading to the power-plant bunkers will also shut down the tipple equipment. This will prevent any piling up of coal on a belt that is not

running or the clogging of other machinery in the tipple or transportation system.

Another interesting feature of the preparation-equipment drive is the three-position master-control switch mounted on the tipple operator's platform. This governs the operation of the tipple and conveying machinery. Normally all motors are electrically interlocked, as has been described, and will start and stop consecutively or in sequence. This occurs when the control lever of this switch is in its first or primary position. When thrown to its secondary position, the Bradford breaker is rendered inoperative, the rest of the equipment starting, operating and stopping as before. This permits by-passing the coal past this machine, when, if the pieces are too large, they may be broken down in the power company's roll crusher. In the third position, all pieces of equipment are operated independently, and any or all may be started or stopped at will.

FAN HAS CONCRETE HOUSING

Approximately 450 ft. northwest from the main shaft a double-compartment air shaft has been sunk. This will contain an airway and a ladderway. A high-speed, multi-blade fan has been installed a few feet to one side of this shaft. This is provided with a re-inforced-concrete casing and fan drift. It is also fitted with an *evasé* discharge and suitable reversing doors. These may be operated from outside the casing.

Mention has frequently been made of the generating plant of the Indiana Power Co. which this mine serves and which in turn serves this mine. This is a concrete, steel and brick structure located almost due south of the main mine shaft and about 600 ft. distant. Coal from the mine plant passes up a pair of inclined belt conveyors, discharging to a transverse inclined conveyor, which delivers it to the bunkers in the top of this plant. The coping of this bunker house stands 134 ft. above the foundation.

From the bunkers the coal is distributed to the boilers by a 30,000-lb. larry, which delivers it to the hoppers of the chain-grate stokers. Eight Babcock & Wilcox 1,726-hp. boilers are installed in this plant. They carry steam at a normal gage pressure of 335 lb. per square inch and at a temperature of 650 deg. F. Each boiler is capable of generating 135,000 lb. of steam from and at 212 deg. F. per hour. They are equipped with forced-draft chain-grate stokers, having a speed of 40 ft. per hour. Ashes discharged over the end of these grates are dumped periodically into railroad cars, which are run into the basement of the plant directly under the ash hoppers. Both power house and mine are served by a branch of the Pennsylvania Lines, extending from Pittsburgh to St. Louis and this road uses the ashes for ballasting tracks and making fills. The power company, however, has some special dump cars of its own which it uses for disposing of this material for its own use.

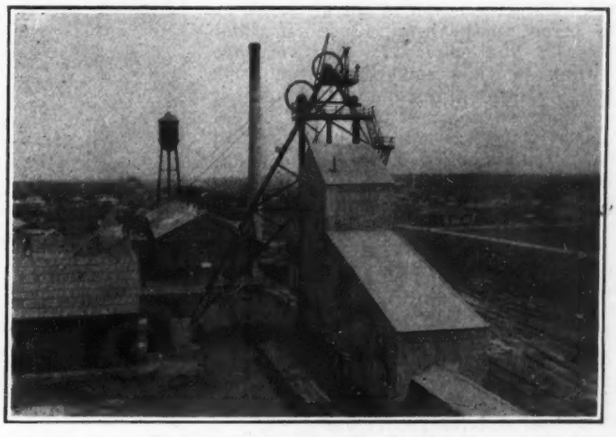
In the generating room of this plant there are installed, at present, three 25,000-kva. 13,200-volt, 1,094-amp., 80-per cent power factor, 3-phase, 60-cycle turbo-generators. These machines operate at 1,800 r.p.m. Condensing water is drawn from the river, strained, filtered, passed through the surface condensers serving these machines and returned to the river. In time of medium to low water it is said that nearly one-third of the river flow is thus utilized for condensing purposes. The northern end of the power plant is of temporary construction to facilitate future additions to the equipment. The two stacks now in use are of steel, 17 ft. in diameter and rise 316 ft. above the foundations. They thus furnish abundant draft.

Switching and control equipment is housed in an ell built on the lower end of the plant proper. A large outdoor substation located in a field adjacent to the plant steps up the current to the proper voltage for transmission. Three lines, in addition to the one serving the mine, radiate from this station. One of these is a two-circuit, steel-tower, 25,000-kw., 125,000-volt line extending to Indianapolis; another, carrying 66,000 volts, extends to Sullivan, Ind., and a third line of the same potential has been built to Terre Haute. Both of these latter lines are carried on wooden poles except where they cross the river bottoms, where steel towers are employed.

The ground surrounding both the power plant and mine has been "landscaped" almost like a park. Flowers and shrubs of many varieties have been planted, lawns have been seeded and other improvements made. Dangerous portions of the property have been isolated by means of high, strong metal fences. It will take a few years to develop to the full the artistic effect of these grounds, but eventually they will give the plant an unusually pleasing appearance.

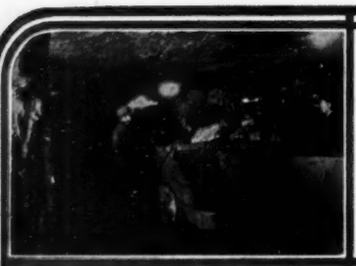
CURRENT GENERATION MUST EQUAL NEEDS

Year by year the power requirements of this country are steadily growing. Abundantly endowed with vast natural resources—a fertile soil, large quantities of gravel, sand and limestone furnishing building material, and immense deposits of clay capable of supplying raw materials for present and possible future ceramic developments—such centers as Indianapolis, Terre Haute, and Sullivan, as well as the smaller communities round about them are daily increasing their power needs. Electricity is also becoming notably useful in lessening the drudgery once considered a concomitant evil of housekeeping. An increase in generating capacity must of necessity keep pace with this growing consumption of current. To many engineers the logical place to build a power plant is where water is abundant and fuel comparatively cheap. Few localities could be found in this country where natural conditions are more advantageous for a dual mining and power-generating venture than this site of the Dresser mine and plant "on the banks of the Wabash."

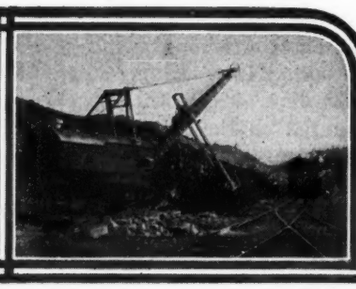


Auxiliary Tipple at New Orient

This structure is used almost solely for the inspection of coal. The mere fact that the miner never knows what car is going through the inspection process has proved a powerful incentive for the loading of a clean product.



News Of the Industry



Baldwin Fails in Compromise Plan For Agreement to End Coal Strike; Miners Reject Government Backing

Efforts of Premier Stanley Baldwin to effect a compromise settlement of the British coal strike—now nearing the end of its fifth month—were no more successful last week than the fruitless negotiations undertaken several days earlier by Winston Churchill, Chancellor of the Exchequer. Even an appeal which promised the miners the support of the government in the demand for an agreement that would be national in spirit, if not in words, if the men would return to work fell upon deaf ears.

Shortly after his return from France Mr. Baldwin took up the campaign to end the strike where Mr. Churchill had left off. The plan of an agreement which should be national in principle was indorsed by the Premier and his Cabinet. Representatives of the coal owners and the workers were invited to meet the government officials at 10 Downing Street on Sept. 17. It was following these conferences that the government made its offer of support to the miners in a letter to A. J. Cook, general secretary of the British Miners' Federation.

Owners Less Uncompromising

In setting forth the government plan, which also includes the creation of a National Arbitration Tribunal, the Premier stated that the mine owners had refused in the most emphatic terms to discuss wages or hours of labor with the Miners' Federation and that it was not within the power of the government to force another conference on those issues. The employers, however, are willing to yield somewhat from their former uncompromising stand against anything savoring of a national agreement. They now are ready to acknowledge the existence of certain principles which should be nationally applied and are willing that these principles should receive national recognition.

If the miners were prepared to recognize economic facts and to start to work on provisional district settlements, continued Mr. Baldwin, the government would enact the proper legislation to insure the application of these national principles. For this purpose, the Premier suggested the setting up of a National Arbitration Tribunal.

This idea of district agreements in a national framework, however, has failed to excite any enthusiasm among the miners. "Unless the terms put forward by the coal owners are changed very much," announced Mr. Cook the night the Premier outlined his scheme," and unless a nation-wide agreement for negotiations and settlement is allowed, we are a long, long way from a settlement of this dispute."

The government proposals were considered at an all-day session of the executives of the Miners' Federation on Monday of this week. The session adjourned, however, without announcing any definite decision as to a future course of action. General opinion, hopeful a fortnight ago that the Churchill-Baldwin formula would be accepted by both owners and miners as offering a face-saving escape from a bad situation, is now pessimistic.

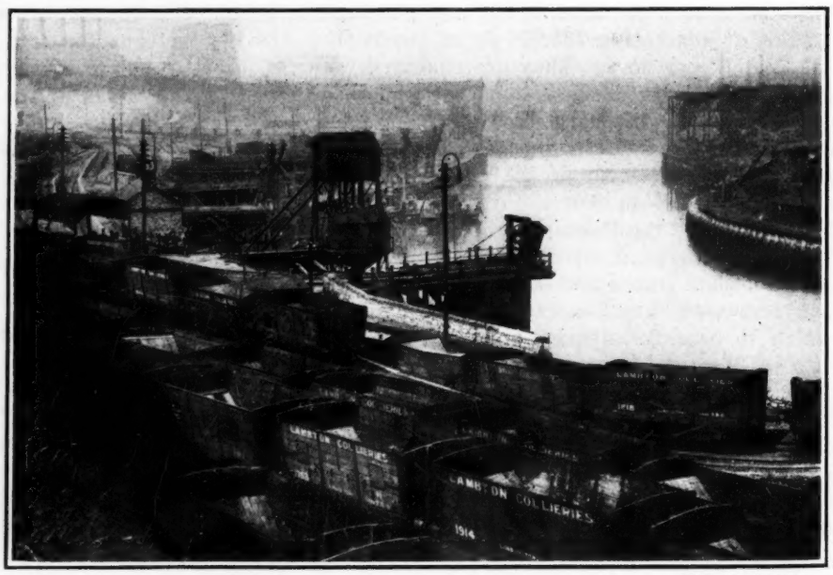
Coal Imports Still Heavy

Whether the government will take any further steps in advance of a definite reply from the Miners' Federation is not known. In the meantime there is no relaxation in the drive to import coal to meet pressing necessities. During last week more than 200 vessels were chartered to load at American ports. On Friday alone 48 fixtures of bottoms averaging 6,000 tons capacity, were announced. Half of this tonnage was contracted for by the government.

Miners dissatisfied with the conduct of the strike by their leaders continue to drift back to work. Late estimates indicate that approximately 100,000 of the 1,156,000 normally employed have returned to the pits. This is almost double the number estimated to have returned to work by Sept. 10. No accurate figures as to the tonnage raised by the returned workers, however, is available.

Sneed Leaves Clear Field To Fishwick in Illinois

State Senator William J. Sneed, of Herrin, has been appointed vice-president of the Illinois district, United Mine Workers, to fill the vacancy caused by the elevation of Harry Fishwick to the presidency. Sneed has announced that he will seek re-election as vice-president, thus leaving the field to Fishwick in the race for the presidency. Prior to the expulsion of President Farrington Sneed had announced that he would seek election to that office in December. Sneed has stated that the interest of the union in avoiding a political contest at this time prompted his action in not opposing Fishwick for president.



Wide World Photos.

Desolation Wrought by British Coal Strike

Scene at Sunderland, on the River Wear, in the Durham coal field. Not a ship in the stream and not a piece of coal in sight, though in normal times the river teems with activity and the shore is thickly banked with open tops loaded with coal.

Calls Gas Ideal Home Fuel

Low-temperature carbonization of coal will make gas the "ideal and ultimate fuel" for the home and will go a long way toward eliminating the so-called smoke nuisance in the cities, stated Prof. S. W. Parr, University of Illinois, before the American Chemical Society recently in Philadelphia. "Fifty per cent of the smoke nuisance of our cities is chargeable to domestic chimneys," Professor Parr said.

Consolidation Coal Co. Plans Six New Mines

Col. C. W. Watson, president of the Consolidation Coal Co., entertained officials from every department of the company and other notable guests on Sept. 11 at a dinner followed by a motion picture entertainment and playlet portraying the rise and fall of the Consolidation Coal Co. during the war and its subsequent rejuvenation and remarkable "come-back." The affair was held at Fairmont Farms, W. Va., Mr. Watson's residence, following a series of meetings held in the interest of the company in Fairmont. The rejuvenation of the company was depicted by a group of Broadway players in a skit written by a New York playwright.

Among the guests were Daniel Willard, president of the Baltimore & Ohio R.R.; M. C. Byers, president of the Western Maryland Ry.; A. C. Needles, president of the Norfolk & Western Ry.; H. C. Nutt, president of the Monongahela Ry., and W. J. Harahan, president, Chesapeake & Ohio Ry.

During the series of meetings it was announced that six new mines, each with a daily capacity of 3,000 to 6,000 tons, will soon be opened in the Fairmont region. The location of the mines, however, was not made known. The six new mines, it is said, will increase production in the field at least 6,000,000 tons a year. At the present time the company is operating 12 mines, which are producing more coal than 27 mines did three years ago.

R. L. Melendy, director of enginering, spoke of the modern developments in the mining industry and stressed the need for an increase of modern methods, machinery and skilled miners. The opening of the new mines will call for a great construction program in the region, including the installation of modern mining methods, and skilled miners will be in demand. Mr. Melendy stated that railroading methods will be adopted in the underground transportation systems.

The U. S. Civil Service Commission announces an open competitive examination for a vacancy in the position of assistant economic analyst of the Bureau of Mines. Applications must be on file at the Washington office not later than Sept. 28. The successful applicant will succeed to the position held by W. F. McKenney, who resigned from the Bureau in 1925 to join the Stover Smokeless Coal Bureau.

To Investigate Causes of Industrial Depression in Pennsylvania Coal Fields

Study of the causes of the industrial depression in the central and western bituminous regions of Pennsylvania is to be made under the direction of a citizens' committee, headed by Dr. Clyde L. King, Secretary of the Commonwealth. The work will not be undertaken by the State of Pennsylvania, for Dr. King will not begin his survey until after he resigns as a state official, probably late this month.

This is the first step in an effort to present facts to the citizens of the affected areas upon which intelligent remedial action may be based. Start will be made in the central bituminous field during the present month. The western district will receive attention shortly after the study of the central begins.

Under the name of Pennsylvania Industrial Survey, the study will be carried on by a group of workers with field headquarters at Cresson. The survey was organized at the instance of business men of the affected areas, who have waited in vain for relief from the deepening depression which is slowly strangling communities in the coal fields. Its purpose is to ascertain the facts about industrial and living conditions, to the end that the combined intelligence of the citizens may be applied to them.

To Cover All Industries

Agriculture, transportation, manufacture and mining will form the principal studies, though all phases of industrial and social life of the citizens will be included.

The work will be financed by public subscriptions to the report.

An advisory committee for the central division has just been announced. It includes:

W. B. Adams, attorney, Punxsutawney; Dr. W. Frank Beck, farmer, Altoona; W. L. Burchfield, merchant, Philipsburg; Charles Dinger, merchant, Reynoldsville; J. A. Farabaugh, farmer, Bradley Junction; Robert B. Gable, merchant, Altoona; Richard Gilbert, miner, Clearfield; William A. Hagerty, attorney, Clearfield; Daniel Kough, amusements, Windber; Bertram Leopold, merchant, Altoona; James J. Mack, merchant, DuBois; Dwight C. Morgan, publisher, Kittanning; Philip H. Murray, miner, Pittsburgh; A. J. Musser, coal operator, Indiana; John O. Reams, merchant, Berlin; Judge S. L. Reed, Ebensburg; Harry B. Scott, coal operator, Philipsburg; Lee T. Shannon, traction interests, Johnstown; H. E. Wagoner, merchant, Coalport. T. D. Stiles will handle statistics; John P. Guyer, publicity.

In accepting the directorship of the survey, Dr. King outlined the scope of the work in the following statement:

"This is a survey of the industries of central Pennsylvania. The market for each of the essential industries of this section will be studied in order to find out what the market for each industry was in the past, what the market is now, what the future market may well be, and what changes are advisable to get the best possible market for each of those industries. As an aid to this, living costs and working conditions will be ascertained as compared with living costs and working conditions in competing industries elsewhere.

"Chambers of Commerce of various cities have undertaken surveys to boost their trade and local and national surveys have been made of separate industries, such as agriculture and coal, but as yet no large scale survey has been made in this country intended to show the existing markets of all the industries in so large a territory and their relation one to the other, with the query always in mind as to what can be done to expand the earning power of each industry.

"The bituminous region of Pennsylvania is a small empire in itself. It has great natural resources of forests and coal, of soil and of building materials. It is blessed with a sturdy hard-working people. From such gifts should come an increasing prosperity based on informed community action."

Dr. King is the editor of *The Annals*, publication of the American Academy of Political and Social Science, and has made a number of studies for state and national bodies, in addition to conducting research work on several industries.

Wadleigh Resigns Editorship

F. R. Wadleigh

F. R. Wadleigh resigned as editor of *Coal and Coal Trade Journal* on Sept. 14, effective immediately, and is no longer connected in any capacity with either the Coal Publishing Corporation or the Combustion Publishing Corporation. Formerly Federal Fuel Distributor and head of the coal division of the Department of Commerce, Mr. Wadleigh has had a long and honorable career in the coal industry. He will engage in consulting work on coal in addition to certain permanent activities for several public-utility companies in connection with their coal supplies. His office is at 1 Broadway, New York City.

R. C. Beadle has assumed the post of editor of *Coal and Coal Trade Journal* in addition to that of publisher, which he formerly held.

Pan-Handle Coal Co. Awarded $160,753 in Court Decree

A decree has been handed down in the U. S. District Court at Norfolk, Va., by federal Judge D. Lawrence Groner in favor of W. W. Houston and Paul L. James, trading as the Pan-Handle Coal Co., against Dexter & Carpenter, of Delaware, fixing the amount to be recovered by the plaintiff at $160,753.40. The decree confirms the report of Special Master Robert W. Shultice, to whom the matter was referred by a decree of June 21, 1924.

The plaintiffs alleged that they were entitled to share equally in profits from the sale and commissions on the output of the J. B. B. Coal mines in McDowell County, W. Va., and allege that they had been defrauded of half of these profits, which they allege to have been between $300,000 and $500,000.

Prior to 1920 the Pan-Handle Coal Co. was engaged in business in Norfolk, Newport News, Charleston, S. C., and New York. Plaintiffs alleged that about that time they were approached by an officer of the J. B. B. mines with an offer to turn over to them the entire output of the mines for sale on a commission basis if they would advance $200,000 toward the purchase of the mines. The plaintiffs alleged that they entered into an agreement with Dexter & Carpenter, Inc., whereby each was to put up $100,000 and each was to share equally in the profits from the transaction.

When the plaintiffs had deposited $50,000, they alleged, and stood ready to advance the remaining $50,000 on notice, they were informed that Dexter & Carpenter had entered into an agreement with the J. B. B. mines whereby they controlled the majority of stock and the Pan-Handle Coal Co. received a refund of its $50,000. The plaintiffs were informed, they alleged, that some arrangement would be made for them to share in the profits, but the arrangement failed to materialize. The court decree followed.

To Study Mine Ventilation At A.I.M.E. Meeting

At the general meeting of the American Institute of Mining and Metallurgical Engineers to be held in Pittsburgh Oct. 5 to 9 there will be a meeting of the Institute's committee on mine ventilation. This meeting will be held at 9 a.m., Oct. 8, in the auditorium of the U. S. Bureau of Mines.

Of the papers to be presented the following are of direct concern in the problem of mine ventilation: "State Coal-Mining Laws Concerning Mine Ventilation," by J. A. Garcia; "Occurrence of Fire Damp in Bituminous Coal Mines," by Frank Haas; "Mine Air Flow," by G. E. McElroy; "Application of Kutter's Formula to Gases," by F. Ernest Brackett.

During the Institute meeting there will be a meeting of the technical coal mining committee of the committee on mine ventilation, and at present there is talk also of a meeting of the technical fan committee.

Colonel Clarence T. Starr

Indiana Progressives Name Ticket for Union Offices

A "progressive" ticket of candidates for official positions in the Eleventh district of the United Mine Workers (Indiana) with which the "progressive" faction of the district hopes to defeat the present office holders up for re-election in November, was announced last week.

The "progressive" ticket includes: Will Stinson, Oakland City, Ind., for president; Robert McGuire, Terre Haute, for vice-president; David B. Robb, Terre Haute, for secretary; W. J. Brogan, Evansville, board member from subdistrict 1; E. C. Sweazy, board member, subdistrict 2; Benjamin Rillings, board member, subdistrict 3; and J. G. Lyons, board member, subdistrict 4.

William Stapleton, who previously announced that he would run independently against William Mitch, present district secretary, has withdrawn from the race.

The officers elected in November will serve two-year terms.

Independence Will Achieve Real Fuel Independence

Independence, Mo., is about to live up to its name.

According to information received at Washington, this city, which has been splitting the municipal business between coal and fuel oil on a 50-50 basis, has let contracts for stoker equipment and will soon use only coal in the city fuel plants. The present municipal plant operates on an over-all efficiency of approximately 50 per cent. When the stoker equipment has been installed, it will operate at a guaranteed minimum of 73 per cent.

The Missouri city uses about 11,000 tons of coal annually.

C. T. Starr Named Director Of Two Mining Companies

Col. Clarence T. Starr has been elected to the directorates of the Pittsburgh Terminal Coal Corporation and the Powhatan Mining Co., according to an announcement last week. He also has been made vice-president of the Powhatan company. Colonel Starr resigned the management of the Coal Division of the Chamber of Commerce of the United States in April to become assistant to the president of the Pittsburgh Terminal Coal Corporation. Colonel Starr is in charge of the operating departments of both companies, the combined production of which approximates 600,000 tons a month. The Powhatan mines are operating, primarily, in the No. 8 District of Ohio.

Second Ohio Union Official Deposed as Disloyal

For the second time in a week the axe of the officials of the Ohio district, United Mine Workers, has fallen and Vice-President Fred Hemsley of the Hocking Valley subdistrict, who assumed the duties of president following the decapitation of Robert Marshall, has been dismissed from office. The charges in both instances were the same. It is alleged that both men accepted money from operators in their campaign for re-election several months ago.

Both Marshall and Hemsley have been debarred from holding office for five years but were not deprived of membership in the union. As the Hocking Valley subdistrict was without a head, the state executive board named Oral Daugherty, of Buchtel, to act as temporary president. Both deposed chiefs will carry their cases to John L. Lewis, international president.

Indiana Mines Speed Up

With the approach of autumn the mining industry throughout Indiana is responding to the increased seasonal demand and many mines which had been idle for some time are resuming operations and a number which have been working have increased their production.

Tyler G. Lawton, president of District No. 11, United Mine Workers, says the industry as a whole throughout the state is more active and more coal is being produced than at the same time last year.

Practically every mine in the Knox County field is now working with the exception of the Bruceville mine and one at Bicknell. The Indian Creek and Wheatland mines were the two latest in the Knox County field to resume operations.

The Bolt-Criss mine No. 6, at Hymera, operated by the Hymera Coal Co., resumed operations last week and the Dresser mine, at the Dresser power plant, is now hoisting coal after an idleness of several weeks. The Dresser is a new mine, and the men refused to work until a contract was signed with the union organization. This has been done and the miners are now working on a union contract.

Ruthless Competition Hits Profits But Boosts Non-Union Production, Kentucky Coal Report for 1925 Shows

By Paul Wooton
Washington Correspondent of *Coal Age*

Further light on the remorseless working of the competitive situation in coal is shed by the final figures on operations in Kentucky during 1925, which just have been compiled under the supervision of F. G. Tryon of the economics branch of the U. S. Bureau of Mines. The figures show the non-union side of the picture. They represent in large measure the opposite of the condition in Ohio, which was analyzed in this correspondence on page 372 of the issue of Sept. 9.

The total production in Kentucky in 1925 was 55,069,000 tons. This is even higher than the preliminary estimates based on railroad shipments. The final figures show an increase of 4 per cent over the estimate.

In 1915 Kentucky's production was around 21,000,000 tons, so that in ten years the output of the state has more than doubled. The greater part of this increase, however, has come since the war. In comparison with 1918, the year 1925 shows an increase of 23,000,000 tons. In comparison with 1920, a growth of 20,000,000 tons is shown. As late as 1920 Ohio was far ahead of Kentucky. In 1925 Kentucky produced twice as much coal as did Ohio.

This shift in tonnage from union to non-union states has been apparent to all, so that the figures prove nothing new, but do establish the extent of the shift. One of the very interesting features of the 1925 statistics is the change which has gone on in Kentucky itself. Here the forces have operated to eliminate the smaller mines. Considering only the commercial mines, it is found that the number of active producers in eastern Kentucky dropped from 663 in 1923 to 480 in 1925.

In western Kentucky the number dropped from 172 in 1923 to 161 in 1925. The result has been to concentrate business in the hands of the larger mines. The average output per commercial mine in 1923 in eastern Kentucky was 50,000 tons. In 1925 the average had risen to 89,000 tons.

A similar although less striking change took place in western Kentucky. The closing of the small mines was characterized by a shrinking of the total actual number employed, despite an increase in the working forces of the larger mines. In 1923 the average number employed was 60,800 men, while in 1925 the number was 57,000 men. This decrease is the more remarkable because it was accomplished in the face of an increase of 25 per cent in the production.

With fewer mines and fewer men and with an increased output, the average time worked showed a healthy improvement. As late as 1923 the average number of days worked was 153, less than one-half the potential working year. In 1924 the days worked rose to 174, while in 1925 the average rose to 206 days.

In comparison with the performance of states where working time is steady, such as New Mexico, for instance, this still is a bad showing, but it indicates that substantial progress is being made toward the deflation of excess capacity.

Perhaps the most significant thing shown is the decline in sales realization. The average value of all coal produced in the state last year was $1.72 f.o.b. mines, as against $2.54 in 1923 and $1.88 in 1924. Thus it will be seen that in two years the average price in the state has been reduced by one-third and 1925 shows a decrease with even 1924 of 16c. a ton. At a time when profits, if they exist at all, are measured in cents per ton this decrease is eloquent testimony as to the keenness of the competitive struggle.

Average Higher in East Kentucky

The figures of average prices are even more interesting by districts. In Harlan County the average was $1.91. In Letcher County, which may be taken as typical of northeastern Kentucky, the figure was $1.80. For Perry County, the largest producer in the Hazard district, the figure was $1.75. For eastern Kentucky as a whole the average was $1.80.

Low as are the foregoing prices they do not touch western Kentucky, whose output of 12,000,000 tons was sold at an average realization of $1.44.

Production, Value, Men Employed, Days Worked and Output per Man per Day At Coal Mines in Kentucky in 1925[1]

(Exclusive of Product of Wagon Mines)

	Net Tons					Value		Number of Employees						
								Underground						
	Loaded at Mines for Shipment	Sold to Local Trade and Used by Employees	Used at Mines for Steam and Heat	Made Into Coke at Mines	Total Quantity	Total	Average per Ton	Miners, Loaders and Shot-firers	Haulage and Track	All Others	Surface	Total	Average Number of Days Worked	Average Tons per Man per Day
Eastern district:														
Bell	2,719,241	36,104	13,291	.....	2,768,636	$4,710,000	$1.70	2,273	464	404	523	3,664	187	4.03
Boyd	9,700	3,718	.....	.....	13,418	28,000	2.09	46	....	20	10	76	90	1.97
Breathitt	170,468	10,506	3,534	.....	184,508	293,000	1.59	202	44	17	41	304	204	2.97
Carter	68,945	38,423	63	.....	107,431	195,000	1.82	119	33	18	21	191	210	2.69
Clay	101,887	1,230	.....	.....	103,117	176,000	1.71	168	35	9	51	263	159	2.47
Floyd	4,813,523	54,455	47,804	.....	4,915,782	8,707,000	1.77	2,833	662	522	712	4,729	237	4.38
Harlan	11,110,205	69,681	47,530	126,189	11,353,605	21,634,000	1.91	5,754	1,260	1,249	1,533	9,796	234	4.96
Johnson	1,169,870	14,379	19,372	.....	1,203,621	2,589,000	2.15	801	153	158	206	1,318	244	3.75
Knott	465,566	1,708	.....	.....	467,274	708,000	1.52	181	42	41	52	316	214	6.91
Knox	366,158	12,723	6,691	.....	385,572	627,000	1.63	458	86	81	112	737	155	3.38
Laurel	158,870	.....	.....	.....	158,870	281,000	1.77	163	62	6	29	260	239	2.55
Lee	900	1,740	.....	.....	2,640	6,000	2.27	14	....	2	3	19	90	1.54
Letcher	5,896,682	62,491	54,747	.....	6,013,920	10,813,000	1.80	2,729	817	704	634	4,884	248	4.97
McCreary	858,513	13,643	1,220	.....	873,376	1,575,000	1.80	718	70	112	129	1,029	185	4.60
Martin	436,436	2,630	.....	.....	439,066	602,000	1.37	141	48	45	40	274	214	7.47
Morgan	21,002	3,202	2,984	.....	27,188	106,000	3.90	45	16	33	69	163	239	.70
Perry	5,785,612	71,243	2,051	.....	5,858,906	10,269,000	1.75	3,235	915	486	866	5,502	221	4.82
Pike	7,070,711	53,901	50,791	.....	7,175,403	12,367,000	1.72	3,483	826	1,377	1,284	6,970	241	4.28
Whitley	682,337	15,163	12,978	.....	710,478	1,497,000	2.11	817	110	162	163	1,252	179	3.17
Other counties[2]	118,102	1,200	.....	.....	119,302	145,000	1.22	60	14	6	16	96	216	5.75
Total	42,024,728	468,140	263,056	126,189	42,882,113	$77,328,000	$1.80	24,240	5,657	5,452	6,494	41,843	226	5.54
Western district:														
Daviess	81,924	58,461	709	.....	141,094	$202,000	$1.43	123	....	31	18	172	208	3.95
Henderson	338,967	51,339	12,522	.....	402,828	537,000	1.33	290	97	71	59	517	164	4.75
Hopkins	3,781,913	91,556	40,851	.....	3,914,320	5,565,000	1.42	2,261	575	455	1,099	4,390	147	6.05
McLean	71,116	275	4,883	.....	76,274	104,000	1.36	83	22	5	14	124	124	4.96
Muhlenberg	3,645,459	39,231	53,594	.....	3,738,284	5,058,000	1.35	2,977	500	672	547	4,696	151	5.27
Ohio	850,655	11,390	17,478	.....	879,523	1,938,000	2.20	1,098	149	103	316	1,666	115	4.59
Union	955,958	43,700	23,106	.....	1,022,764	1,382,000	1.35	676	123	289	171	1,259	180	4.52
Webster	1,933,512	26,245	11,864	.....	1,971,621	2,663,000	1.35	1,434	238	375	250	2,297	169	5.08
Other counties[3]	36,849	3,000	.....	.....	39,849	48,000	1.20	34	....	9	17	60	210	3.16
Total	11,696,353	325,197	165,007	.....	12,186,557	$17,947,000	$1.44	8,976	1,704	2,010	2,491	15,181	152	5.27
Total All Kentucky	53,721,081	793,337	428,063	126,189	55,068,670	$94,825,000	$1.72	33,216	7,361	7,462	8,985	57,024	206	4.68

[1]The figures relate only to the active mines of commercial size that produced coal in 1925. The number of such mines in eastern Kentucky was 480 in 1925, 496 in 1924, and 663 in 1923; in western Kentucky, 161 in 1925, 164 in 1924 and 172 in 1923.
[2]Lawrence, Magoffin, and Wayne.
[3]Caldwell, Christian and Crittenden.

Smokeless Men Combine Golf With Business Sessions

Operators, sales managers and railroad officials, to the number of 125, were in attendance at one of the most enjoyable outing-meetings in the history of the West Virginia Smokeless Coal Operators' Association last week at the Greenbrier, White Sulphur Springs, the final feature being a banquet Saturday evening. Credit for the well-balanced program is largely due to this committee: Holly Stover, (chairman), R. H. Knode and Major L. Rodman Page, Jr., and Secretary E. J. McVann.

The program opened Sept. 15 with about seventy golfers participating in medal play for qualification in the invitation and the operators' tournaments. The finals were played Sept. 18.

Holly Stover was the host at a dinner party Thursday evening. This was not only a delightful affair but also one of educational value to the seventy-five guests of the Stover Smokeless Bureau. Mr. Stover recommended to the members of his Bureau the standardization of sizes and the making of sales contracts Jan. 1, rather than April 1. W. F. McKenney, statistician of the Bureau, with the aid of a set of graphs, lucidly discussed cumulative figures on production, movement and realization on past shipments. It was really the first honest-to-goodness presentation of activities of the West Virginia smokeless fields. Dr. F. C. Honnold, of Chicago, opined the operators would develop a growing taste for essential statistics of this nature, and Col. William D. Ord expressed the hope they would translate the significance of this statistical information into the conduct of their business.

Service Sold at Cost

Dr. Honnold gave a very interesting outline of the purpose and program of the Chicago Fuel Service and Research Institute. The basic principle he enunciated is that, save gifts from a friend, people appreciate only that for which they pay, hence the idea of fuel service should be sold at cost. It is hoped to make the service self-supporting within three years. A. T. Murphy, publisher of *Black Diamond*, made forceful comments respecting sales policies of smokeless operators with Chicago dealers.

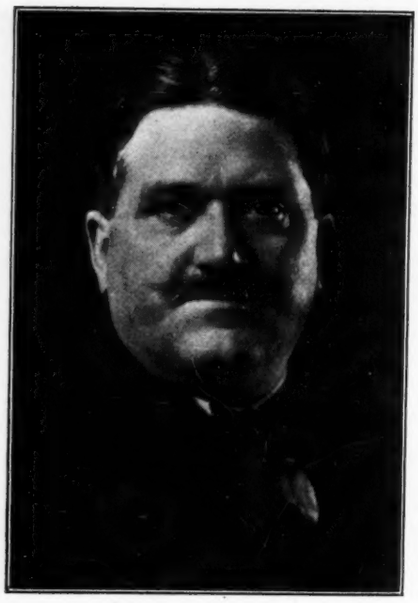
At a business meeting on Friday, Col. William D. Ord, president of the association, was authorized to name a committee to prepare appropriate resolutions respecting the death of Thomas F. Farrell. O. L. Alexander, vice-president of the Pocahontas Fuel Co., was named to succeed the late Mr. Farrell on the Board of Governors.

The tidewater general rate investigation was discussed, and plans were made to get evidence in shape for the New York hearing, Oct. 6.

A written report by R. H. Gross, chairman of the committee in charge of the New England Service Bureau, Boston, in recommendation of the continuation of the Bureau on its present basis until April 1, 1927, was approved.

It was decided to lend the services of Denny B. Goode to the committee in charge of the exhibit to be made by the Smokeless Association at the Southern Exposition, Oct. 2-10, in Madison Square Garden, New York, where 800 sq.ft. of floor space has been rented for a mechanical and advertising display. The committee in charge is: Charles B. Ebbert (chairman), George Daniels and J. E. Westervelt, all of New York City.

Members were urged to attend the bituminous coal conference to be held in Pittsburgh, under the auspices of Carnegie Institute in November.



Dr. F. C. Honnold

Plan Non-Partisan Survey Of Coal Mining in Ohio

A state-wide committee upon which there will be no person connected with coal mining in Ohio is being organized by the Ohio Chamber of Commerce to make a survey of the mining industry in that state "with a view to rendering such service and assistance from other business interests that may be practicable." The committee will be made up in a short time and is expected to start its work at once.

Karl S. Dixon, secretary of the Zanesville Chamber of Commerce, has been lent by his board of directors to the Ohio Chamber of Commerce to conduct the work of the committee in making its investigations and its recommendations. George DeCamp, director of the Federal Reserve Bank of Cleveland, will be vice-chairman of the committee. The chairman has not been selected.

President McMillan of the Ohio Chamber of Commerce said; "I can not anticipate what the committee will do. In the end it may not be able to accomplish anything. One thing is certain and that is that the coal industry calamity has outgrown any labor controversy. It affects all Ohio business."

Railroads Continue to Gain In Fuel Efficiency

Class 1 railroads of the United States achieved the highest efficiency on record in the use of fuel by locomotives during the first six months of this year according to the Bureau of Railway Economics. During that period an average of 142 lb. of fuel was required to haul 1,000 tons of freight and equipment, including locomotive and tender, a distance of one mile. The average in the first half of 1925 was 144 lb. and in 1923 it was 170 lb.

Similar efficiency in the conservation of fuel was realized in the passenger service in the first six months this year, with an average consumption of 16.3 lb. to move each passenger train car a distance of one mile. During the corresponding period in 1925 the average was 16.6, while in 1923 it was 19.2 lb. In 1920 it was 19.6 lb.

Class 1 railroads during the first six months this year consumed for road locomotive fuel a total of 49,935,063 net tons of coal and 990,537,707 gallons of fuel oil. These amounts were somewhat greater than during the corresponding period in 1925, coal consumption being 5.3 per cent greater and fuel-oil consumption 0.9 per cent greater. This increase in the aggregate consumption of fuel was due wholly to the heavier traffic handled.

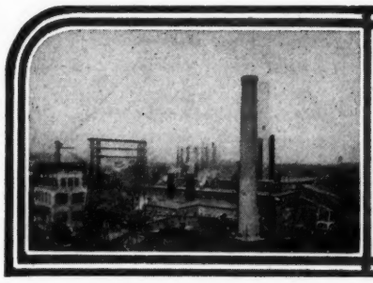
Factors contributing to this better performance this year included improved locomotives built with a view of increasing the tractive power while at the same time reducing the amount of fuel needed to operate them, educational programs carried on by the various roads to instruct firemen as to the proper method of stoking locomotives and to encourage fuel conservation, closer inspection of coal purchased by the carriers in order to obtain a better grade of fuel than formerly, increase in the length of "runs" of locomotives and greater expedition in the handling of trains through terminals and along the lines.

To Resume Ship Fuel Tests At League Island

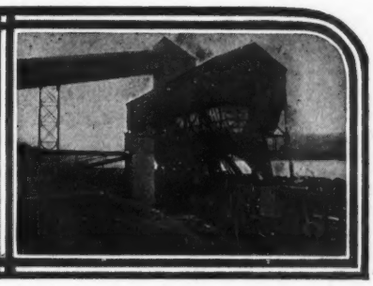
Captain Charles A. McAllister, president of the American Bureau of Shipping, presided over a meeting Sept. 15, at the offices of the U. S. Shipping Board, 45 Broadway, New York City, to discuss the use of pulverized coal as fuel for steamships instead of oil or ordinary coal. It was decided to resume tests at the League Island Navy Yard, Philadelphia, and to call another meeting at the Shipping Board offices on Sept. 24.

Captain McAllister said the result of the experiments made so far at League Island had been fairly satisfactory and those to be made would be watched with interest by American shipping men as it was hoped that a big saving would be effected in the cost of fuel, which was a large item in the cost of operation of steamships.

The Captain added that in the event of the adoption of pulverized coal as fuel it would be necessary to change the furnaces and install special appliances on ships.



News Items From Field and Trade



ALABAMA

Modern Homes and Plant Going Up.—The Alabama By-Products Corporation is building a modern village for its employees at Praco and Quinton Mines, Flat Creek division. About 500 bungalows with modern conveniences will be erected, and graded streets and alleys will be laid out and parks and playgrounds provided. A filtering plant will supply the village with pure water for domestic use. Modern equipment is being added inside the mines to increase production and efficient handling. Improvements include a new tipple at the Praco mine. The mines in this division of the corporation have received much attention since they were acquired from the Pratt Consolidated Coal Co. in the merger some time ago and a large amount of modern equipment both inside and out has been installed and with the improvements now under way the mine will be able to produce 3,000 tons daily.

Labor Shake-up Coming.—The state administration which assumes office in January is pledged to remove all convicts from the coal mines as soon as practicable. This will bring about drastic changes in labor conditions at several of the largest operations in the district which now have contracts with the state and use convict labor exclusively in their mines, the contracts calling for the delivery of the coal at a fixed rate per ton.

Bon Air Improvements Completed.—The Stith Coal Co., which has been developing a shaft at its Bon Air Mine, in Walker County, for some time, has about completed this work and installed machinery and equipment for handling the output of the new operation. A double hoist of large capacity will bring the coal from the bottom of the pit where it will be assembled in several concrete bins. The coal will be dumped over the same tipple now serving the drift operations at this place.

A contract has been awarded for two slope operations to be developed by Moss & McCormack in Fayette County, near Carbon Hill. The company is now operating two drift openings at Howard, on the Pratt seam, and the coal from the new slopes will be handled over the same tipple but kept entirely separate in the process of preparation and delivery to the bins, being produced from one of the seams underlying the Pratt. Moss & McCormack have head offices in Birmingham.

Aldridge Shaft Nears Completion.—The Stith Coal Co.'s big shaft at the Aldridge mine, Aldridge, is nearing completion. It will be the best equipped shaft south of Illinois, it is said. The shaft will cost $150,000. The capacity of this mine will be increased to 4,000 tons daily. Two large concrete bins are being built at the bottom of the shaft into which coal will be dumped from mining cars. Double skips are installed for hoisting coal out of the mine. One comes up while the other goes down. This mine will be equipped to dump 1,000 tons of coal per hour. The new shaft will be operated automatically at bottom and top.

ARKANSAS

The Harding-Weatherton Coal Co. of Spadra, with a capital of $14,200, has been incorporated to succeed the Kemp-Hardin company, which filed articles of dissolution recently. The incorporators are J. E. Hardin, president, and J. H. Muldoon, secretary-treasurer.

COLORADO

National Fuel Elects Officers.—At a stockholders' meeting of the new National Fuel Co., held Sept. 6, the following directors were elected: H. J. Alexander, J. C. Gunter, F. R. Brookman, W. S. Iliff and H. Van Mater. The directors elected the following officials: H. Van Mater, president; W. S. Iliff, vice-president; W. H. Sprenkel, secretary, and O. S. Moore, assistant secretary.

ILLINOIS

Watson Mine Has Bright Prospect.—The Watson mine at Herrin, has reopened with 175 men employed. This mine, which is operated by the Sincerity Coal Co., has excellent prospects of operating all winter. When the mine closed down a few months ago the company owed the miners two weeks' pay, which it was unable to meet. E. M. Stotlar, receiver for the company, made the miners a proposition that if they would waive claim to immediate payment the mine would be operated at once and that a sinking fund of 5c per ton of coal mined would be set aside to take up the unpaid labor claims. The men agreed to this proposal and indications are the mine can work without interruption, as there is a good demand for its product.

Chicago Aims to Suppress Smoke.—Chicago is in the midst of a smoke-abatement campaign. Violators of the city smoke ordinance are being haled into court and fined. The effect has been to turn many consumers of Illinois coal to the Pocahontas and New River product. As an aid in educating building managers, janitors, and engineers the city Health Commissioner has issued rules for the prevention of smoke in heating plants. Five of the railroads whose roundhouses have been the scenes of dense smoke have agreed to construct huge power plants which will generate steam smokelessly, pump the steam into the locomotives to permit them to pull away from the roundhouses without having any fires in their fireboxes. The fire will not be started until the locomotive is on the way.

The Burr mine, about two miles northwest of Carterville, has just been reopened for work, after being closed since spring. Indications of better conditions in southern Illinois coal fields have led to the reopening of four or five mines in the district within the past month.

Chicago Coal Men Plan Meetings.—The Hotel La Salle has been chosen by the program committee of the Chicago Coal Merchants' Association as the regular meeting place of the association during the season of 1926-27. As was the case last year, meetings will be held on the second and fourth Tuesday of each month, evening dinner meetings alternating with noon luncheons. The schedule of the meetings follow: Evenings, at 6:30 o'clock—Oct. 12, Nov. 9, Dec. 14, Jan. 11, Feb. 8, March 8, April 12 and May 10. Luncheons, at 12:30 p.m.—Sept. 28, Oct. 26, Nov. 23, Dec. 28, Jan. 25, Feb. 24 (Thursday), March 22, April 26 and May 24.

Standard Oil Places Big Coal Order.—The Standard Oil Co. has closed a contract in the Chicago coal market for screenings from the Indiana No. 5 field, central Illinois and western Kentucky covering the rest of the coal year ending March 31 at $2.85 delivered Chicago. The bulk of the tonnage was let in the Indiana No. 5 field. The company consumes between seventy-five and one hundred cars of fine coal a day at its Whiting (Ind.) plant. Various operators were given parcels of the business.

Marion & Eastern R.R. Sold.—The Cosgrove-Meehan Coal Co. of Johnstown, Pa., has sold the Marion & Eastern R.R. to the Missouri Pacific R.R. at a purchase price given on a basis of approximately $400 per share of common stock. The sale has been approved by the Interstate Commerce Commission. The Marion & Eastern operates a belt line in the southern Illinois coal field between Paulton and Marion, Ill. This road, which has been owned for a number of years by the Cosgrove-Meehan company, serves seven of the largest shaft mines in the southern Illinois district. The seven mines have a combined daily production of over

20,000 tons, included in which are two of the Franco mines owned by the Cosgrove-Meehan Coal Co. of Illinois. It connects with the Missouri Pacific, Chicago & Eastern Illinois and Illinois Central railroads. Under the terms of the sale the purchasers agree to maintain service along the line and to handle service as heretofore with the other two connecting roads. The officers of the Marion & Eastern were John C. Cosgrove, chairman of the board; H. J. Meehan, vice-presdient, and J. E. Graham, secretary-treasurer, all of Johnstown, Pa.

Examinations will be conducted by the State Miners Examining Board at Danville, Sept. 23; Farmington, Sept. 24, and Peoria, Sept. 25.

When the Reichert mine, at Freeburg, was reopened by the Robinson mine-rescue team of Duquoin, under the direction of James Richards, State Mine Inspector, and Fred Leppert, St. Clair County Mine Inspector, the air was heavily laden with black damp, as the air course had fallen in. A new air course was constructed. It also was found that fire was still burning in three rooms. These were permanently sealed and will be permanently sealed with concrete or tile within a few days.

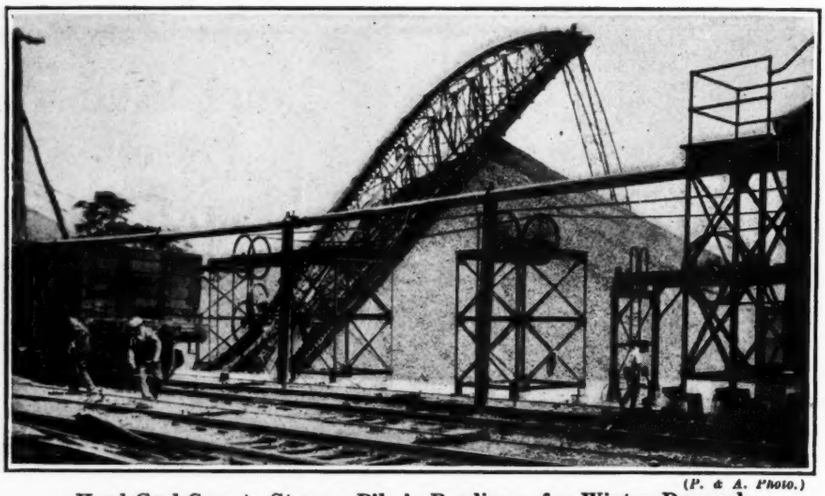
INDIANA

Pennsy at Work on New Dock.—Construction of a large coal dock for the Pennsylvania R.R. at Fort Wayne has begun and efforts will be made to have it in operation by the first of the year. The new dock will be considerably larger and more modern than the present one. It will be of reinforced concrete and will be 110 ft. long, 20 ft. wide and 70 ft. high, with a 22-ft. clearance above the ground level. It will have a capacity of 650 tons of coal and will be able to handle 80 tons an hour. The operation will be electric.

Would Unionize Lucy Mine.—W. T. Roberts, secretary of the Fifth Ohio subdistrict, United Mine Workers, said negotiations had been on for three days with the Paisley interests of Cleveland for reopening the Lucy mine at Neffs, idle since the first of the year, when the company closed it because the men refused to accept a scale of wages less than the Jacksonville. Roberts said the company offered to sign up the Jacksonville scale and put 300 men to work at the Lucy mine, but miners' officials refused to accept unless the company would sign the scale for its three mines at Elm Grove, W. Va., now operating on non-union basis.

Fire destroyed the tipple of the Power Coal Co.'s mine, east of Terre Haute, on the night of Sept. 7. The origin of the fire is unknown.

The cancellation of a contract made on June 17, 1919, providing for the removal of the Rider Vein of coal under their property and $200 alleged payments due on royalty are asked by Herman Keiser in a suit filed in Terre Haute against Harry Kern, coal operator there. The suit alleges that the late Gilbert Spears and Kern entered into an agreement for the removal of the coal from the Spears farm, Kern agreeing to pay 8 1-3c. a ton and not less than $25 a month. Sears since has died and the property was purchased by Keiser and the lease assigned to him. He alleges the defendant has failed to pay the royalty of $25 a month for the last eight months.



(P. & A. Photo.)

Hard Coal Goes to Storage Pile in Readiness for Winter Demand

Although some of the smaller independent anthracite producers curtailed operations because of summer slackness, most of the larger companies kept running full time and the coal that did not find a ready market was placed in storage. The above picture shows two of six piles along the D., L. & W. R.R. at Wyoming, Luzerne County, Pa. More than 100,000 tons has been dumped thus far, but it is likely that 250,000 tons eventually will be stored at this plant.

Indian Creek Mine Electrified.—After eight months of idleness due to the burning of the tipple, the Indian Creek coal mine at Bicknell has resumed work. For a time only the south side of the mine is to be worked. Despite the long suspension the bottom is reported in excellent condition. It has been converted into an electrically operated plant with a modern electric hoist. The panel method for cutting coal has been adopted. Heretofore the mine has been using the room and pillar mode of work.

Black Bear Tipple Burns.—The tipple of the old Black Bear mine, southeast of Staunton, owned by the Maumee Collieries Co., recently was destroyed by a fire of unknown origin. The mine has not been operated for three or four years. Officers of the company said the loss was small.

After working a force of 20 men for nearly a week at unloading equipment and laying tracks to its 639-acre tract of coal land southwest of Brazil, the Mid-Continent Coal Co. reloaded the equipment and moved it to a field west of Clinton. The machinery, which includes a gigantic steam shovel, will be set up there in a stripping field, where it is reported coal is more readily accessible than in the Brazil field. The latter will be developed at a later date, officials of the company were quoted as saying.

KENTUCKY

Compensation Rates Advanced. — Underground coal mining insurance under the compensation act has been raised from a basic rate of $4.57 per $100 of mine payroll to $11.16 under authorization of the Workmen's Compensation Board. The raise was authorized Sept. 7, Forrest Fields, secretary of the board, said. Mr. Fields said that under a sliding scale companies may obtain a rate of $3.50 or $4 by providing proper safeguards for workmen. These scales are determined by "experience" in each individual mine, by the first aid provided by the mine, by its cleanliness, its practice of mining and many other technical points which would lower the cost of compensation insurance.

At Pikeville a $100,000 damage suit, the largest ever filed in the Circuit Court there, has been filed against Rogers Brothers Coal Co., and Fon Rogers, of Lexington, by Mrs. Georgia A. Johns, of Williamson, W. Va., who seeks this sum for alleged failure of the company to comply with the terms of a lease contract entered into several years ago. The lease was for 99 years, and provided a minimum royalty of 9c. a ton for coal removed from the leased property. It is also charged that the lessees agreed to construct a bridge across Tug River and four miles of standard railroad.

C. P. Bartlit, of Indianapolis; Ralph Bartlit, of Cincinnati, and E. H. Mould, formerly in charge of Henry Ford's Kentucky coal lands, have purchased a controlling interest in the Darby Coal Co., of Evarts. All of the new money put into the company will be used for the purchase of the latest tipple and loading machinery devices. The company works the famous No. 5 seam. Incidentally Ralph Bartli, some twenty years ago, was one of the projectors of the Darby Coal Co. at St. Charles, Va., and when he disposed of his interests in this it was with the intention of withdrawing from the mining end of the business. His brother is the head of the Clear Creek Coal Co. in the Hoosier capital.

PENNSYLVANIA

Two Miners Die of Injuries.—Horribly mutilated as the result of a blast at the No. 4 colliery of the Lehigh Coal & Navigation Co., Lansford, Sept. 1, George Mehalko, 40, died the following day. Philip Satigati, 27, of Lansford,

entombed with Dominic Martino at No. 5 colliery Sept. 1, was found dead by rescue workers the next morning. Martino was only slightly injured but Satigati was caught by a second fall of rock and muck.

Winmore Mine on 1917 Scale.—The Winmore mine of the Wineland-Gilmore Coal Co., at Smithton, Westmoreland County, has resumed operations on a non-union basis, paying the 1917 scale. This operation, which had been idle since 1923, is not far from the Euclid mine of the Pittsburgh Coal Co., which also is working independently of the union.

Oakville Company to Dissolve.—The mine of the Oakville Coal Co. and the Elizabeth coke plant near Latrobe have suspended operations. Officers of the Oakville company decided some time ago that it would be too expensive to remove the coal remaining in the mine. Therefore as soon as the coal stored at the Elizabeth ovens has been disposed of the company will be dissolved.

Republic Mine to Be Modernized.—The Republic Iron & Steel Co. has launched an electrification installation program at its Republic mines, Republic, preliminary to replacing its own steam-generated current with purchased power. The work probably will be completed by Jan. 1. Interior operations of the Republic mines were electrified several years ago. The new program involves the installation of full automatic controlled sub-station; replacing steam hoisting with modern electric hoists; installation of a modern new electrically operated fan and complete new electrically operated main pumping equipment. Electric current will be supplied by the West Penn Power Co. When the new installation is complete the monthly production will average about 50,000 tons.

VIRGINIA

Virginia Mines Active in August.—Coal production in Virginia during August, 1,035,430 tons, acording to C. B. Neel, secretary of the Virginia Coal Operators Association, was the largest since February this year and the largest August in the history of the Virginia field. The total 1926 production, 8,625,000 tons to date, exceeds by 1,000,000 tons the largest previous production in the history of the field for the first eight months of the year, according to figures compiled by the State Chamber of Commerce.

The Big Vein Anthracite Coal Co., at McCoy, has resumed full-time operations. The mines had been working on a four-day-a-week schedule for some time. It is expected that full time operations will continue at these mines during the fall and winter months.

The Great Valley Co., at McCoy, has commenced grading for a standard-gage railroad siding, connecting with the Virginian Ry. lines near McCoy. This siding will be about a half mile long when completed.

The Kemmerer-Gem Coal Co., of St. Charles, has just completed the installation of a new and modern tipple which will permit the company to ship prepared coal and largely to increase production. Jack Dawson, formerly connected with the Clinchfield and Blackwood companies, is superintendent of the company.

Ralph Ealand, formerly connected with the Norton Coal Co., Norton, is preparing to open a new mine in the Dungannon section of the Virginia coal field for the Hagen estate.

The Hawthorne Coal Co. has completed development work and is shipping coal now from its No. 4 mine, on Guests River, midway between the Norton Coal Co. and Esserville.

WEST VIRGINIA

Coal Fall Kills Miner.—Edward Ford, 60 years old, recently received fatal injuries in the Wolf Summit mine of the Wolf Summit Coal Co. when several tons of coal dropped upon him without warning. A companion, Arthur Harris, just escaped. Ford was not instantly killed, and miners toiled furiously to reach him while his groans could be heard. He was dead when removed. Ford was a native of Alabama.

Panhandle Institute Meets.—The Panhandle Mining Institute held its annual banquet in Wheeling recently with nearly 200 mining men in attendance. Speakers for the event were Prof. C. E. Lawall of the mining engineering department of the University of West Virginia and Prof. A. C. Callen of the University of Illinois. R. M. Lambie, chief of the State Department of Mines, also was scheduled to speak.

Improvements at mines Nos. 7 and 5 of the Carbon Fuel Co. at Carbon, on Cabin Creek, are progressing nicely and the company expects to complete its large wooden tipple about Nov. 1. Coal from both mines will be dumped over the same tipple. The capacity of the tipple will be 1,500 tons per day.

Fire Causes 300 to Be Idle.—Three hundred miners were thrown out of work at the Glendale mine of the Glendale Gas Coal Co., Glendale, by a fire in the mine which started Sept. 12, when a short-circuit from a wire falling set fire to five loaded coal cars. Deputy Mine Inspector A. E. Lafferty, of Moundsville, with the rescue crews from Hatchman Coal Co. mines hurried to the scene to help fight the fire, which was located in entry No. 5. Superintendent Elkins, in charge of the mine, stated the fire was under control the following day. The mine resumed operation Sept. 15.

The Kingston Pocahontas Coal Co. will construct a new steel tipple at Exeter.

Fire which on Sunday, Sept. 5, threatened for a time to destroy the large tipple of the Crab Orchard Improvement Co. at Eccles, was extinguished through the efforts of the Beckley fire department after four hours of hard work. A cable supporting the cage was melted and the cage dropped to the bottom of the shaft. There were six men in the mine when the fire broke out and some apprehension was felt as to their safety for a time. A temporary cage was used to bring the men from the bottom of the shaft after the fire had been put out.

Scotts Run Output High.—Scotts Run mines set a new high record Sept. 10, when they loaded 272 cars at 18 plants, while the Maidsville district loaded 93 cars to make the total for Monongalia County 365 cars, the largest tonnage loaded since the strike was called. The 272 cars produced in the Scotts Run field represents about 80 per cent of the tonnage during peak production. Operators in the region state that plenty of men are available to fill positions necessary to take care of present orders.

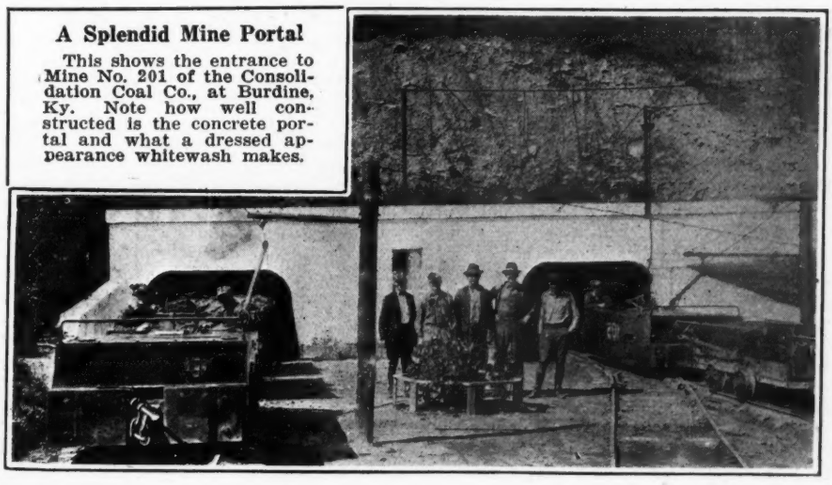
CANADA

Prospectors Seek Protection.—A general demand has arisen among prospectors for some action on the part of the Ontario Department of Mines which will extend the time within which fees have to be paid for boring permits in the prospective coal fields near Long Rapids and also for an extension of time within which boring operations have to be commenced. Chas. McCrea, Minister of Mines, has been making extensive inquiries, and an early decision is expected in regard to methods by which the interests of prospectors may be safeguarded and with a minimum of delay in the development of the new field.

Installs Rock Crusher.—The Dominion Coal Co. has installed a large rock crusher at its No. 2B colliery, Glace Bay, N. S., for rock dust for this and other collieries. The company is rapidly creating stone-dust zones throughout all dry and dusty mines.

A Splendid Mine Portal

This shows the entrance to Mine No. 201 of the Consolidation Coal Co., at Burdine, Ky. Note how well constructed is the concrete portal and what a dressed appearance whitewash makes.



Among the Coal Men

C. P. White, Chief of the Economics Branch of the U. S. Bureau of Mines, Department of Commerce, was operated on Sept. 17, at the Emergency Hospital, Washington, D. C. His condition is reported to be favorable.

L. J. Barraclough, of Burton-on-Trent, England, who received an "exhibition" awarded by the Institution of Mining Engineers of Great Britain, has just completed an eighteen weeks inspection of the mines of the United

L. J. Barraclough

States in course of which he visited operations in western Pennsylvania, the exposition at Cincinnati and mines in Kentucky, Virginia and West Virginia. He says that he was surprised to find that loading was only in its experimental stages, it being thought by many in Great Britain that the whole of the coal of the United States is being mechanically mined and loaded. Mr. Barraclough was graduated from Birmingham University, being the Sir John Cadman medallist at that institution. From that time until his tour of inspection, he was a student of mining at the Netherseal Colliery, in south Derbyshire. Prior to coming to this country he visited many mines in Europe.

Joseph Yerly has resigned as superintendent of Mine No. 1, Zeigler, Ill., after thirteen years' service. He has witnessed immense growth in the mining industry and in the town of Zeigler, having served the mine during the period of the World War, when the mine was being rapidly developed and extended. He also has been an active worker for civic betterment in Zeigler.

W. T. Reid of Price, Utah, has been appointed superintendent of the Carbon Fuel Co.'s properties at Rains. He succeeds B. P. Manley. Mr. Reid has acted in a similar capacity for the Lion Coal Co. of Ogden in the past.

The Consumers' Mutual Coal Co., Salt Lake City, Utah, has appointed Charles Leger, Helper, its superintendent for the Gordon Creek district. Mr. Leger has been mine superintendent at another Carbon County camp.

Charles H. Nesbitt, chief mine inspector for Alabama, whose term recently expired, has been reappointed by Governor Brandon for another term of three years. Mr. Nesbitt holds the palm for long service as head of the state mining department, having first been appointed by Governor O'Neal in 1912 and recommissioned by each succeeding administration. During his incumbency close co-operation has been maintained between the department and operators in the promotion of safety methods and the betterment of working conditions in the mines and statistical records have been gathered and prepared in such form as to be of great usefullness to the industry. George Kuffner, an associate mine inspector whose term has just expired, was also recommissioned.

J. V. N. Dorr, president of the Dorr Co., New York City, returned from a short European trip early this month.

W. F. Hanley has been appointed chief engineer of the West Virginia Coal & Coke Co., with headquarters at Omar, W. Va.

W. E. Cox, superintendent of the No. 2 mine of the Francisco Mining Co. at Francisco, Ind., has resigned to accept a position with the Peabody Coal Co. at Taylorsville, Ill.

A. F. Paterson, assistant sales manager of the Smokeless Fuel Co., Charleston, W. Va., has accepted a similar position with the Logan Pocahontas Fuel Co.

Obituary

Davis Coal & Coke Head Dies

Alfred W. Calloway, president of the Davis Coal & Coke Co., having headquarters in Baltimore and fourteen mines in West Virginia and one in Pennsylvania, died suddenly of heart disease at his home in Merion, a suburb of Philadelphia, on Sept. 13. Born in Manchester, England, in 1872, Mr. Calloway came to this country in 1882. He was educated in the public schools of Brooklyn, where he was graduated from high school at the age of sixteen. He entered the employ of the Pennsylvania R.R. in 1888 as rodman, and remained with the company five years.

His connection with the coal industry began in 1893, when he became identified with the Rochester & Pittsburgh Coal & Iron Co. and affiliated companies at Punxsutawney, Pa., becoming assistant superintendent and later general manager. In 1913 he became president of the Davis Coal & Coke Co., in 1917 president of the Pittsburgh Terminal Coal Co. and subsequently chairman of the board. He also was a director and member of the executive committee of the Consolidation Coal Co.

When Dr. Garfield was Federal Fuel Administrator he named Mr. Calloway

Alfred W. Calloway

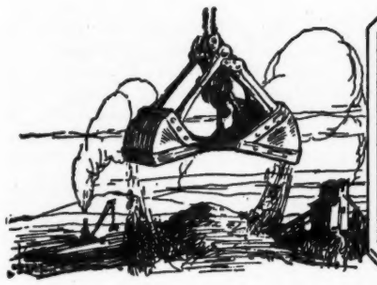
as director of bituminous coal distribution, which post he filled from February, 1918, to July, 1919.

R. H. Heyser, general manager of the Majestic Collieries, Majestic, Ky., on the West Virginia border, was found dead in his office at Williamson, W. Va., on Sept. 13, shot through the head, and with his hand grasping a discharged pistol. Officers did not believe that he committed suicide, and suspected murder, although it was admitted that nothing definite had been found on which to base the supposition, other than that it appeared that the shot had been fired at a greater distance than would have been the case in event of suicide.

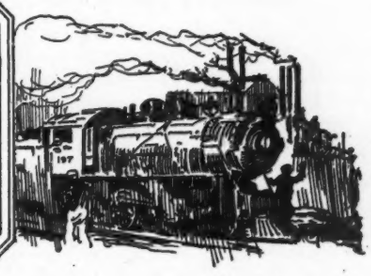
Oliver H. Hagerman, superintendent of shipping and marine service of the Reading Company, Port Richmond, Philadelphia, died suddenly at his home at Elkins Park, Pa., on Sept. 8. Due to his many years' connection with the coal piers he was known to every shipper of coal, both anthracite and bituminous, in the Philadelphia district. He entered the employ of the old P. & R. R.R. in 1878 as an office boy, and for the past 27 years had been in charge of the piers and shipping at Port Richmond. He also was manager of the Philadelphia Grain Elevator Co. He is survived by his wife and three daughters.

Association Activities

F. S. Love, president of the Union Collieries Co., Pittsburgh, is the new chairman of the publicity committee of the National Coal Association. The other members of the committee are Douglas Gorman, president, Cumberland Coal Co., Baltimore, Md.; Arthur E. Marriott, general manager, Marriott Coal Co., Moberly, Mo.; Otis Mouser, president, Stonega Coke & Coal Co., Philadelphia, Pa.; C. L. Ryley, president, Happy Coal Co., Lexington, Ky.; W. C. State, general manager, Wheeling Township Coal Mining Co., Akron, Ohio, and W. M. Wilshire, president, West Virginia Coal & Coke Co., Cincinnati, Ohio. At least one additional member will later be named by President Barnum.



Production And the Market



Seasonal Rise in Domestic Call and Heavy Exports Counteract Waning Flow of Coal to Lakes

An extraordinary overseas demand and the normal seasonal expansion in domestic requirements for bituminous coal fuse to form the controlling factor in the soft-coal markets of the country at the present time. The first-named movement is sweeping a large part of the southern end of the Appalachian Region free of surplus coal at a time when the slowing up in lake shipments might bring increasing pressure upon all-rail inland markets. The broadening of domestic demand—particularly in the Middle West—is checked only by the ability of the producers to market an increased output of small coal concurrently with the larger sizes.

A secondary factor about which little is heard at this time, but which may crowd the present primary influence for position, is the car shortage. On the whole, the service accorded the mines by the railroads has been excellent. In a large degree this service has acted as a brake upon rising prices. The fluidity of transportation also has encouraged large industrial consumers to run with smaller reserve stocks than were thought advisable in the old days of recurring car shortages. The car surplus, however, is uncomfortably small, and railroads are frankly warning consumers that only prompt handling will prevent a crisis.

Upward Movement in Prices Continues

The advance in spot prices continues. Notwithstanding slight losses on certain sizes in specific markets—especially on screenings in Chicago—weighted average prices in all fields either held previous gains or showed an advance. *Coal Age* Index of spot bituminous prices for Sept. 20 was 181 and the corresponding weighted average price was $2.19—an increase of five points and 6c. over Sept. 13. These figures, also registered twice in January, are the highest recorded this year.

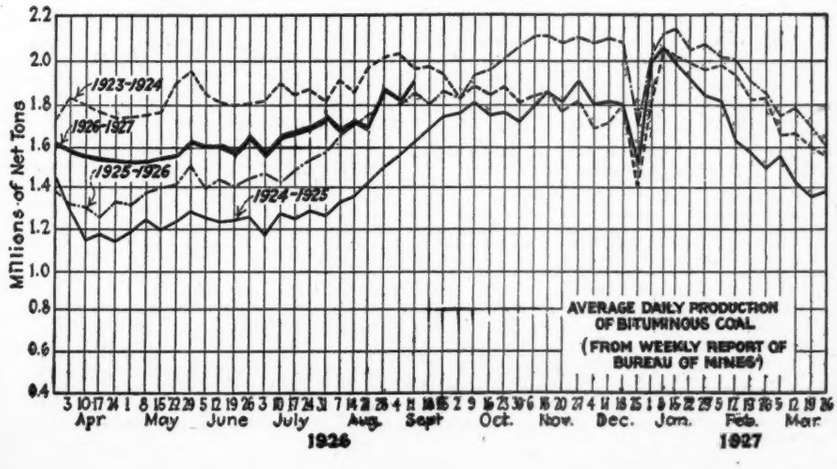
Weekly bituminous production is at a high rate. Despite the holiday loss of 785,000 net tons during the week ended Sept. 11, the daily average increased 58,000 tons. Loadings the first two days of last week indicated a recovery which would again push the weekly output over the 11,000,000-ton mark. Lake dumpings, however, are less of a factor in maintaining the high rate. During the week ended Sept. 19 the total dumped was 835,983 tons of cargo and 55,569 tons of vessel fuel. This brought the season's total to that date to 20,922,808 tons, as against 18,676,138 tons last year, 16,219,332 tons in 1924 and 22,431,845 tons in 1923.

Anthracite Maintains Position

Domestic anthracite is riding on the crest of the wage of the householders' rebellion against forced substitution of fuels last winter. Stove maintains its undisputed leadership; chestnut is growing in strength, but egg and pea are easier. Independent prices at New York have been advanced again, but other markets show a distaste for increasing premiums on domestic tonnage. In spite of the strong position of hard coal, the field for other fuels is quietly expanding.

Conditions in the steam division of the trade are mixed. Some No. 1 buckwheat still goes into storage and independent producers are compelled to make sharp concessions in prices to effect prompt disposition. Rice, too, is none too strong. Barley is in the best position of all, but even here coal is moving at less than the company circulars.

The Connellsville coke trade is marking time. The recent advances in prices on furnace coke have been maintained, but there is no great demand for spot tonnage. Scattered orders for fuel for domestic consumption are now coming into the market.



Estimates of Production

(Net Tons)

	1925	1926
BITUMINOUS		
Aug. 28	11,133,000	11,217,000
Sept 4 (a)	10,827,000	11,015,000
Sept 11 (b)	9,983,000	10,230,000
Daily average	1,849,000	1,994,000
Cal. yr. to date (c)	336,108,000	374,753,000
Daily av. to date	1,566,000	1,746,000
ANTHRACITE		
Aug. 28	2,263,000	1,999,000
Sept 4	434,000	1,951,000
Sept. 11	5,000	1,690,000
Cal. yr. to date (c)	61,233,000	55,884,000
BEEHIVE COKE		
Sept. 4 (a)	166,000	184,000
Sept 11 (b)	167,000	180,000
Cal. yr. to date (c)	6,700,000	8,463,000

(a) Revised since last report. (b) Subject to revision. (c) Adjusted to equalize number of days in the two years.

Midwestern Situation Spotty

The undertone of the market in the Middle West is strong, but superficial developments are spotty. High prices on Eastern coals have increased the demand for prepared sizes of southern Illinois. Many mines in the latter field have been put on a full-time basis and "no-bill" cars of the larger sizes have disappeared. On the other hand, a few mines in the same district are blocked by accumulations of smaller coal.

Notwithstanding floods which interfered seriously with stripping operations in both Illinois and Indiana, screenings from the Hoosier state are extremely weak. Competition from western Kentucky, where some coal has been offered as low as 65c., is the explanation given. Orders for prepared sizes of Indiana coal lag behind those for Illinois. On the whole, the steam situation in both states still is unsettled.

Many eastern Kentucky shippers have declined to book further September orders and talk of $3@$3.25 on block for October delivery. High-volatile quotations from West Virginia continue to advance almost daily. A little free smokeless lump and egg is offered at $5.50@$6, with few takers. Mine-run is held at $2.75 and buyers fight shy of paying the price asked. Anthracite is stronger and there are rumors of an advance by some shippers on Oct. 1.

Car Shortage Hinted

Although there has been no complaint of car shortage in the Illinois-Indiana fields, the possibilities are in the air. For the time being, however, there are too many "no bills" scattered about to give a serious edge to the talk. Working time in the Duquoin-Jackson County area is improving as domestic buying grows, but railroad and other industrial buying is slow. Railroad tonnage, however, still is the mainstay in the Mt. Olive district. Domestic business also is picking up in that section. There has been no change for the better in the Standard field, where only 6-in. lump at low prices finds a ready market.

The local market at St. Louis is fairly good, with a rising demand for southern Illinois coals. Coke, too, is moving well. Western Kentucky is placing considerable tonnage in St. Louis territory, particularly west of the Mississippi River. East of the river, West Virginia and eastern Kentucky are popular. In the steam trade, western Kentucky has been gaining ground steadily in St. Louis. Local wagon deliveries are slow at the present time.

The hardening process still is going on in the Louisville market. Block coal from both sections of Kentucky is more firmly held. There is very little eastern Kentucky block to be had at $2.50 and only occasional offerings of choice western 6-in. under $2. Some special grades of eastern Kentucky block bring up to $3.25. Mine-run is firm at $1.50@$1.75 and slack steady at $1.10@$1.25. Lump, egg and nut are $2.25@$2.50.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern	Market Quoted	Sept. 21 1925	Sept. 4 1926	Sept. 13 1926	Sept. 20 1926†
Smokeless lump	Columbus	$4.75	$4.35	$4.35	**$4.50@$5.00**
Smokeless mine run	Columbus	2.55	2.30	2.30	**2.35@ 2.75**
Smokeless screenings	Columbus	1.50	1.40	1.40	1.35@ 1.50
Smokeless lump	Chicago	4.75	4.35	4.75	**5.50@ 6.00**
Smokeless mine run	Chicago	2.35	2.35	2.60	2.50@ 2.75
Smokeless lump	Cincinnati	4.75	4.35	4.60	**4.75@ 5.00**
Smokeless mine run	Cincinnati	2.60	2.50	2.75	**2.75@ 3.00**
Smokeless screenings	Cincinnati	1.85	1.85	1.85	1.75@ 2.00
*Smokeless mine run	Boston	5.20	5.40	5.40	**5.50@ 5.60**
Clearfield mine run	Boston	2.50	1.85	2.10	**2.00@ 2.75**
Cambria mine run	Boston	2.60	2.05	2.25	**2.00@ 3.00**
Somerset mine run	Boston	2.25	1.95	1.95	1.90@ 2.00
Pool 1 (Navy Standard)	New York	2.85	2.55	2.55	2.40@ 2.75
Pool 1 (Navy Standard)	Philadelphia	2.65	2.65	2.65	2.50@ 2.80
Pool 1 (Navy Standard)	Baltimore	2.30	2.15	2.20	2.15@ 2.25
Pool 9 (Super. Low Vol.)	New York	2.15	2.05	2.05	1.90@ 2.25
Pool 9 (Super. Low Vol.)	Philadelphia	1.95	2.10	2.10	2.00@ 2.25
Pool 9 (Super. Low Vol.)	Baltimore	2.05	1.85	1.95	1.90@ 2.00
Pool 10 (H.Gr.Low Vol.)	New York	2.00	1.85	1.85	1.75@ 2.00
Pool 10 (H.Gr.Low Vol.)	Philadelphia	1.85	1.85	1.85	1.75@ 2.00
Pool 10 (H.Gr.Low Vol.)	Baltimore	1.90	1.55	1.80	1.80@ 1.85
Pool 11 (Low Vol.)	New York	1.80	1.65	1.65	1.55@ 1.80
Pool 11 (Low Vol.)	Philadelphia	1.70	1.55	1.55	1.45@ 1.70
Pool 11 (Low Vol.)	Baltimore	1.70	1.55	1.75	1.75@ 1.80
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.55	1.40	1.45	1.40@ 1.55
Pool 54-64 (Gas and St.)	Philadelphia	1.60	1.55	1.55	**1.45@ 1.75**
Pool 54-64 (Gas and St.)	Baltimore	1.65	1.55	1.70	1.65@ 1.75
Pittsburgh sc'd gas	Pittsburgh	2.50	2.30	2.40	2.35@ 2.50
Pittsburgh gas mine run	Pittsburgh	2.15	2.10	2.10	2.00@ 2.20
Pittsburgh mine run (St.)	Pittsburgh	2.05	2.00	2.00	1.90@ 2.10
Pittsburgh slack (Gas)	Pittsburgh	1.55	1.20	1.35	**1.35@ 1.45**
Kanawha lump	Columbus	2.60	2.50	2.50	**2.50@ 3.00**
Kanawha mine run	Columbus	1.70	1.70	1.70	1.60@ 1.85
Kanawha screenings	Columbus	1.30	1.15	1.15	1.10@ 1.25
W. Va. lump	Cincinnati	2.75	2.75	2.75	2.50@ 3.00
W. Va. gas mine run	Cincinnati	1.65	1.85	1.80	1.75@ 1.85
W. Va. steam mine run	Cincinnati	1.55	1.70	1.70	1.65@ 1.75
W. Va. screenings	Cincinnati	1.15	1.30	1.25	**1.25@ 1.40**
Hocking lump	Columbus	2.75	2.40	2.40	2.35@ 2.50
Hocking mine run	Columbus	1.65	1.55	1.55	1.40@ 1.75
Hocking screenings	Columbus	1.30	1.20	1.20	1.15@ 1.25
Pitts. No. 8 lump	Cleveland	2.35	2.15	2.15	**1.85@ 2.50**
Pitts. No. 8 mine run	Cleveland	1.85	1.70	1.70	**1.70@ 1.80**
Pitts. No. 8 screenings	Cleveland	1.45	1.20	1.20	**1.20@ 1.30**

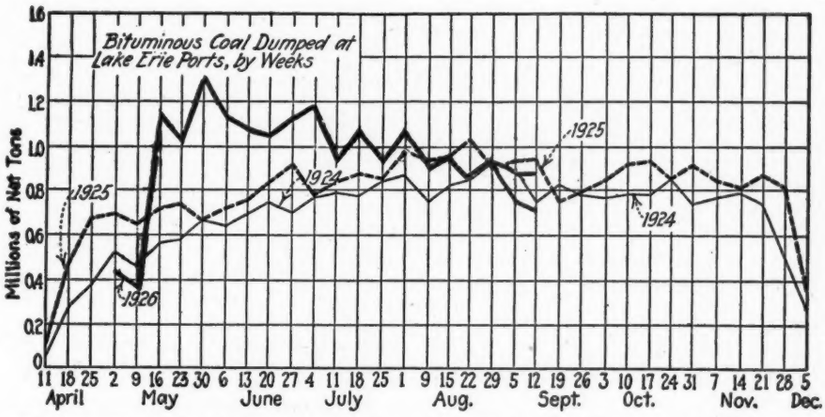
Midwest	Market Quoted	Sept. 21 1925	Sept. 4 1926	Sept. 13 1926	Sept. 20 1926†
Franklin, Ill. lump	Chicago	$3.25	$3.10	$3.25	$3.25
Franklin, Ill. mine run	Chicago	2.35	2.40	2.40	2.35@ 2.50
Franklin, Ill. screenings	Chicago	1.60	1.55	1.55	*1.40@ 1.65*
Central, Ill. lump	Chicago	2.85	2.75	2.60	2.50@ 2.75
Central, Ill. mine run	Chicago	2.10	2.20	2.20	2.15@ 2.25
Central, Ill. screenings	Chicago	1.55	1.50	1.40	1.30@ 1.50
Ind. 4th Vein lump	Chicago	3.10	2.75	2.85	2.75@ 3.00
Ind. 4th Vein mine run	Chicago	2.35	2.25	2.25	2.15@ 2.35
Ind. 4th Vein screenings	Chicago	1.60	1.50	1.45	1.30@ 1.60
Ind. 5th Vein lump	Chicago	2.35	2.35	2.40	2.25@ 2.60
Ind. 5th Vein mine run	Chicago	1.95	2.00	2.00	1.90@ 2.10
Ind. 5th Vein screenings	Chicago	1.20	1.35	1.30	*1.20@ 1.30*
Mt. Olive lump	St. Louis	2.50	2.35	2.60	2.50@ 2.75
Mt. Olive mine run	St. Louis	2.00	2.15	2.25	2.25
Mt. Olive screenings	St. Louis	1.75	1.55	1.55	1.50@ 1.60
Standard lump	St. Louis	2.25	2.25	2.15	2.10@ 2.25
Standard mine run	St. Louis	1.80	1.80	1.80	1.75@ 1.85
Standard screenings	St. Louis	1.15	1.35	1.10	1.00@ 1.25
West Ky. block	Louisville	2.00	1.90	1.90	1.85@ 2.00
West Ky. mine run	Louisville	1.35	1.25	1.25	1.10@ 1.40
West Ky. screenings	Louisville	.80	.85	.85	.75@ .95
West Ky. block	Chicago	2.30	1.60	1.75	**1.75@ 2.00**
West Ky. mine run	Chicago	1.25	1.10	1.15	1.00@ 1.35
South and Southwest					
Big Seam lump	Birmingham	2.25	2.25	2.25	2.00@ 2.50
Big Seam mine run	Birmingham	1.75	1.85	1.85	1.75@ 2.00
Big Seam (washed)	Birmingham	1.85	2.00	2.00	1.75@ 2.25
S. E. Ky. block	Chicago	3.00	2.60	2.60	**2.75@ 3.00**
S. E. Ky. mine run	Chicago	1.95	1.75	1.75	1.60@ 1.90
S. E. Ky. block	Louisville	2.75	2.75	2.75	2.50@ 3.00
S. E. Ky. mine run	Louisville	1.60	1.65	1.65	1.50@ 1.85
S. E. Ky. screenings	Louisville	1.25	1.15	1.15	1.10@ 1.25
S. E. Ky. block	Cincinnati	3.00	2.60	2.85	2.75@ 3.00
S. E. Ky. mine run	Cincinnati	1.60	1.75	1.75	1.65@ 1.85
S. E. Ky. screenings	Cincinnati	1.15	1.30	1.25	**1.25@ 1.40**
Kansas lump	Kansas City	4.35	4.35	4.60	4.50@ 4.75
Kansas mine run	Kansas City	3.10	3.00	3.00	3.00
Kansas screenings	Kansas City	2.50	2.35	2.35	2.35

* Gross tons, f.o.b. vessel, Hampton Roads
† Advances over previous week shown in **heavy type**, declines in *italics*

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Sept. 21, 1925 Independent	Sept. 21, 1925 Company	Sept. 13, 1926 Independent	Sept. 13, 1926 Company	Sept. 20, 1926† Independent	Sept. 20, 1926† Company
Broken	New York	$2.34	.....	$8.20@$8.95	.....	$8.50@$9.25	.....	$8.50@$9.25
Broken	Philadelphia	2.39	‡	‡	$9.25	8.50@ 9.15	$9.25	8.50@ 9.15
Egg	New York	2.34	‡	8.65@ 8.90	8.75@ 9.20	8.75@ 9.25	**8.80@ 9.20**	8.75@ 9.25
Egg	Philadelphia	2.39	‡	‡	9.00@ 9.75	9.00@ 9.15	9.00@ 9.75	9.00@ 9.15
Egg	Chicago*	5.06	$8.17@$8.60	8.03@ 8.28	8.14	8.13	8.14	8.13
Stove	New York	2.34	‡	9.15@ 9.40	9.25@ 9.60	9.25@ 9.50	**9.25@ 9.75**	9.25@ 9.50
Stove	Philadelphia	2.39	‡	‡	9.15@10.20	9.35@ 9.50	9.15@10.20	9.35@ 9.50
Stove	Chicago*	5.06	10.00@11.00	8.48@ 8.80	8.59	8.33@ 8.58	8.59	8.33@ 8.58
Chestnut	New York	2.34	‡	8.65@ 8.95	8.75@ 9.20	8.75@ 9.15	**9.00@ 9.25**	8.75@ 9.15
Chestnut	Philadelphia	2.39	‡	‡	8.50@ 9.75	9.00@ 9.15	8.50@ 9.75	9.00@ 9.15
Chestnut	Chicago*	5.06	10.00@11.00	8.28@ 8.50	8.39	8.33@ 8.53	8.39	8.33@ 8.53
Pea	New York	2.22	‡	5.00@ 6.00	6.00@ 6.50	6.00@ 6.50	**6.25@ 6.75**	6.00@ 6.50
Pea	Philadelphia	2.14	‡	5.00@ 6.00	6.00@ 6.75	6.00@ 6.50	6.00@ 6.75	6.00@ 6.50
Pea	Chicago*	4.79	5.25@ 5.75	5.05@ 5.36	6.03	6.10	6.03	6.10
Buckwheat No. 1	New York	2.22	‡	2.50	1.90@ 2.35	3.00@ 3.50	**2.10@ 2.50**	3.00@ 3.50
Buckwheat No. 1	Philadelphia	2.14	‡	2.50	1.85@ 2.50	2.25@ 2.75	1.85@ 2.50	2.25@ 2.75
Rice	New York	2.22	‡	2.00	1.90@ 2.00	2.00@ 2.25	*1.60@ 2.00*	2.00@ 2.25
Rice	Philadelphia	2.14	‡	2.25	1.30@ 2.00	1.75@ 2.25	1.30@ 2.00	1.75@ 2.25
Barley	New York	2.22	‡	1.50	1.25@ 1.50	1.75@ 2.25	1.25@ 1.50	1.75@ 2.25
Barley	Philadelphia	2.14	‡	1.50	1.25@ 1.75	1.50@ 1.75	1.25@ 1.75	1.50@ 1.75
Birdeye	New York	2.22	‡	1.60	1.60	2.00	*1.25@ 1.60*	2.00.

* Net tons, f.o.b. mines. † Advances over previous week shown in **heavy type**; declines in *italics*.
‡Quotations withdrawn because of strike which started Sept. 1, 1925.



Western Kentucky Screenings Weak

Western Kentucky screenings have not advanced beyond the 75 to 95c. range and mine-run from stripping operations brings some prices on that size down to $1.10, although the general range is $1.40@$1.50 on good coal, with some at $1.25. Domestic demand is swelling, but most of the industrial buying is for current consumption. Better operating time is reported from all parts of the state. Labor conditions are satisfactory and car supply adequate, but close to the margin.

Orders are flowing into the docks at the Head of the Lakes at such a rate that it is freely predicted that September loadings will show up very favorably when compared with 1925. August receipts were 269,664 tons of anthracite and 1,279,290 tons of bituminous coal. This brought the season's totals Sept. 1 to 900,129 tons of anthracite and 6,408,571 tons of bituminous. Compared to last year these were increases of 171,884 and 931,407 tons, respectively. Anthracite receipts for the season are expected to approximate 1,100,000 tons; bituminous, 8,500,000 tons.

The trade at the Twin Cities is reacting to the stimulus of colder weather. Householders have shown more interest in putting in coal, some of it for immediate use. Steam buyers seem to have abandoned hopes that prices would work lower and are placing orders for current requirements at the market. Pocahontas leads in interest at Milwaukee. Retail prices have been advanced to $12.50 for lump and $12 for nut. Anthracite demand also is steady. Coke is retailing at $13.90 for furnace and range—an advance of $1. The industrial call for coal is weaker, but prices are unchanged.

Southwest Holds Gains

The Southwest is holding its recent gains and here and there weak spots are disappearing. In the Kansas market shaft lump is strong at $4.50@$4.75 and strip coal commands $4@$4.25. Recent rains slowed up production from the strip pits and narrowed the differential between prices on stripping and shaft coal. Retail demand is brisk; some shippers are behind on lump and nut. Trade in Arkansas semi-anthracite is improving. Oklahoma, for the first time in weeks, is more active.

Colorado, too, reports steady betterment in domestic demand. Many retailers are stocking up and others are planning to do so. Running time has increased about 7 per cent. Steam coal demand is good. Utah, on the other hand, finds the situation sluggish. Most of the retail dealers stocked up when the special summer storage prices were in effect. Reduced industrial demand, however, is preventing the threatened shortage in screenings.

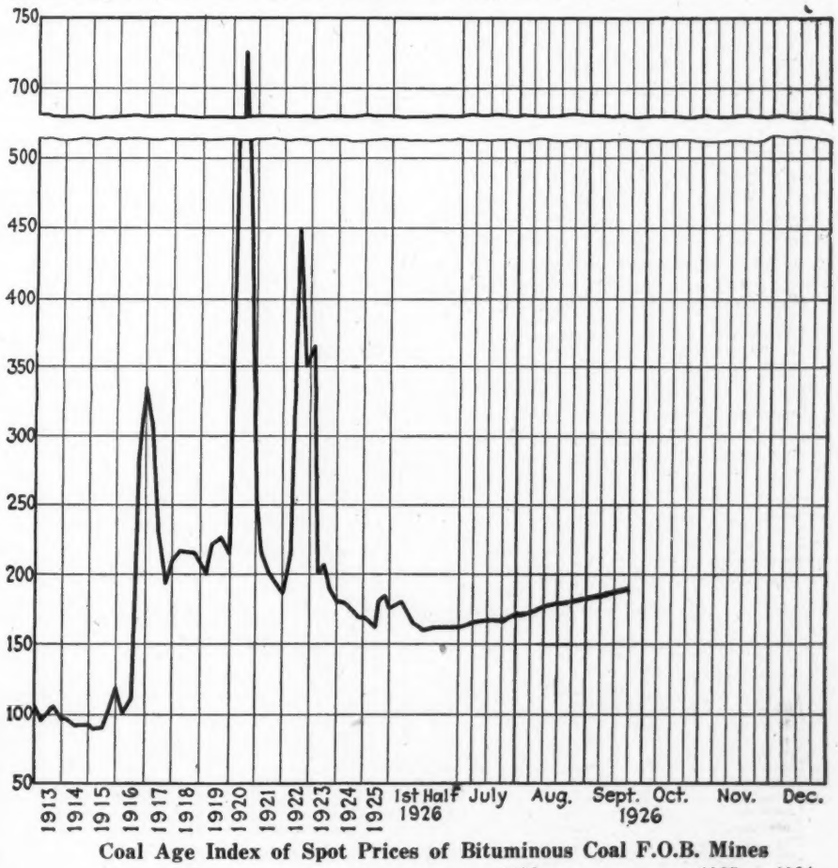
The tidewater situation is the key to the Cincinnati market. Seaboard demand absorbs any surplus left over from lake and all-rail shipments inland and effectually forestalls any price relapse. Smokeless lump and egg are up to $5, although sales still are made at $4.75. Some producers ask $3.50 for nut and up to $3 on mine-run. Slack is strong at $2. Most of the scant supply of free coal now available is tonnage bought by jobbers three or four weeks ago.

High-Volatile Coals Stronger

High-volatile prices also are stronger, but the recent improvement has lacked the showiness of the advances in smokeless quotations. Nominally, except on slack, Cincinnati prices are unchanged, but it is difficult to place orders at or near the minimum figures. Slack prices have advanced in both West Virginia and eastern Kentucky from $1.15@$1.40 to $1.25@$1.40. The retail price on smokeless lump has been boosted to $9.50; high-volatile slack has been pushed to $4.25@$4.50.

The number of cars interchanged through the Cincinnati gateway last week was 14,911—an increase of 772 cars over the preceding week and 783 when compared to last year. Included in the total were 2,875 cars consigned to the lakes for transshipment. While there was an increase of 390 cars in the empty-top movement to the mines, railroads frankly admit the car-supply situation is critical and calls for active cooperation in loading and unloading.

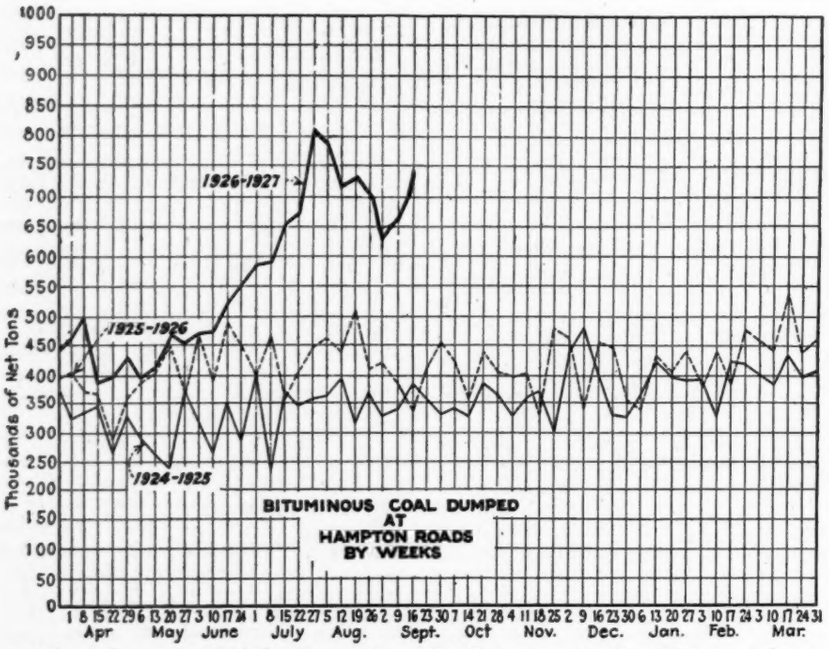
Domestic demand still leads in southern and central Ohio and some middle houses are asking premiums for car numbers. Steam business is improving slowly, but most consumers continue to



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1926				1925	1924
	Sept. 20	Sept. 13	Sept. 4	Aug. 30	Sept. 21	Sept. 22
Index	181	176	171	168	185	169
Weighted average price	$2.19	$2.13	$2.07	$2.04	$2.24	$2.04

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke: 1913-1918," published by the Geological Survey and the War Industries Board.


1926-1927
1925-1926
1924-1925
Thousands of Net Tons
BITUMINOUS COAL DUMPED AT HAMPTON ROADS BY WEEKS
Apr May June July Aug. Sept. Oct Nov. Dec. Jan. Feb. Mar.

practice a hand-to-mouth buying policy in the face of subnormal reserve stocks. Screenings are stronger. Southern Ohio production shows definite improvement under the stress of heavier domestic buying. Current output is estimated at 25 to 28 per cent of capacity.

Northern Ohio in State of Flux

Northern Ohio has not yet found itself, but recent changes, minor in character, point to betterment. Miscellaneous orders are increasing; tidewater buying is relieving the Ohio fields of much of the pressure normally felt from West Virginia and Kentucky. Prices on No. 8 coal are a shade stronger. Output during the week ended Sept. 11 approximated 220,000 tons, or 37.6 per cent of capacity on a five-day week basis. The total was only 22,000 tons less than in the preceding week, when mining was spread over six days.

Undercurrents in the Pittsburgh district run favorably to trade prospects. Prices on prepared sizes and mine-run are unchanged, but slack quotations are slightly higher. Export demand for gas coal continues, but on a smaller basis. Domestic industrial activity is at a high rate. Retail buying now is in full swing. Good 2-in. coal is held at $2.50@$2.60, mines, and 3-in. at $2.75@$2.85. Five-quarter coal is offered at $2.35@$2.50, but there is little domestic demand for this size.

Labor Day took its toll of central Pennsylvania production, but, nevertheless, car loadings for the first eleven days of the month were 1,086 cars ahead of the total for the corresponding period in August. Prices on pool coals have advanced 5 to 15c. Pool 1 is quoted at $2.60@$2.90; pool 71, $2.40@$2.55; pool 9, $2.30@$2.35; pool 10, $2@$2.20; pool 11, $1.75@$1.80; pool 18, $1.70@$1.75.

Only Minor Changes at Buffalo

Aside from a slight weather stimulus, conditions in the Buffalo bituminous market show no important changes. Nominal quotations on a few coals have picked up 5 to 15c., more because of the influence of buying in other markets. The list now stands: Fairmont lump, $1.50@$1.65; mine-run, $1.30@$1.45; slack, $1.10@$1.25; Youghiogheny lump, $2.25@$2.50; slack, $1.30@$1.50; Pittsburgh and No. 8 steam lump, $1.65@$1.85; slack, $1.20@$1.35; Allegheny Valley mine-run, $1.75@$2.

With the news that the British strike deadlock was unbroken, the New England market, which had begun to soften, again hardened last week and on car quotations on Navy Standard coal went from $6.60, Boston, to $6.75, with predictions of $7 this week. At Providence quotations below $6.50 were withdrawn and up to $6.65 was asked. Consumers appear reluctant to pay these prices and buy only when forced by immediate requirements.

Shippers have discovered that the situation at the southern loading piers is distinctly tighter. The lowest quotation heard on pool 1 coal last week was $5.50 gross, f.o.b. Hampton Roads. Little was available for prompt dumping at this price. There is greater activity in all-rail coals. Some good central Pennsylvania low-volatile coal has been sold at $2.25@$2.50. The aggregate tonnage from the northern fields, however, is not large.

New York Market Stronger

Diversion of central Pennsylvania coal to Philadelphia and Baltimore for export and bunker orders has diminished the free supply rolling to the New York piers and made buying at the minimum quotations more difficult. Inquiries for forward tonnages are increasing. Sellers are looking for a much stronger market within the next few weeks. Some consumers are placing surplus coal in storage. Bunker business in the New York harbor is heavier.

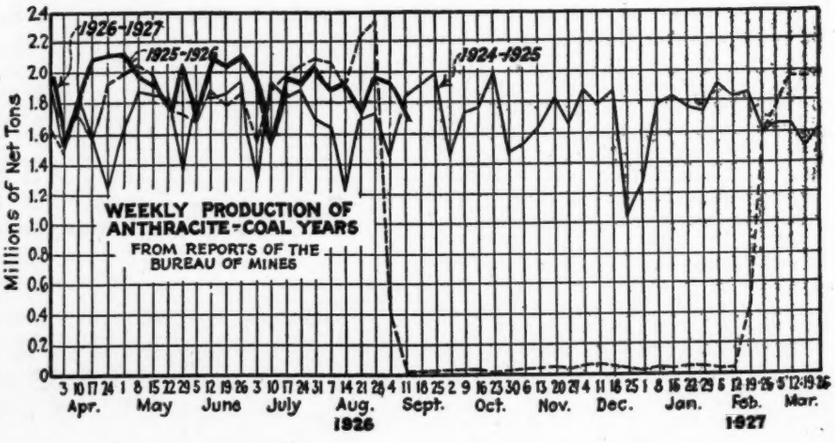
There has been no recession in demand at Philadelphia; on the contrary, it is growing slightly. Railroads find it less easy to dictate prices. Some industrial buyers who placed orders a few weeks ago are regretting that they trimmed their tonnages so closely. Many purchasing agents continue to live from hand to mouth, hoping that the British strike will end and the local trade sag before they are compelled to come into the market for substantial tonnages. Export and bunker business wears a war-time aspect of activity.

Consumers buying in the Baltimore market are beginning to express a livelier concern over the future outlook. There is no scramble for fuel, but purchasing agents are feeling out shippers on the question of supplies for the coming winter. So far there appears to be no threat of a shortage and prices have not reacted to any great extent to the export buying. The latter department of the trade still is working at top speed. During the first two weeks in September over 360,000 tons was loaded for foreign buyers.

Southern Consumption Increases

Increased coal consumption throughout the Birmingham district has resulted in a stronger spot demand and semi-active buying movement in Alabama coal. Day-to-day orders take up the slack in output of high-grade coals, but fuel not suitable for coke-making is sluggish. Railroads are calling for more tonnage. There has been no particular change in the domestic situation, where white ash coals are backward. The coke market is strong, but there has been no advance in prices. Domestic sizes are moving both to the Southeast and to Chicago at $5 for egg, $4.50 for stove and $4 for nut, f.o.b., ovens.

The New York anthracite trade is in good shape. Domestic coals move readily and steam sizes are gaining strength. Some companies, in fact, plan to pick up No. 1 buckwheat out of storage. Chestnut is growing scarcer



Car Loadings and Supply

	Cars Loaded—All Cars	Cars Loaded—Coal Cars
Week ended Sept. 4, 1926	1,151,346	197,877
Week ended Aug. 28, 1926	1,136,233	201,159
Week ended Sept. 5, 1925	1,102,946	178,218
Week ended Aug. 29, 1925	1,124,436	211,683

	Surplus Cars—All Cars	Surplus Cars—Coal Cars	Car Shortages All Cars	Car Shortages Coal Cars
Sept. 8, 1926	141,096	33,039	.....	.....
Aug. 31, 1926	161,478	38,967	.....	.....
Sept. 7, 1925	146,998	43,289	.....	.....

Quotations for independent coals are stronger. Recent gains are held in the Philadelphia market, and buying from distant points is increasing. Local deliveries of stove are falling behind. Pea is the easiest domestic size. No. 1 buckwheat again is going into storage, rice is easy, but there is no surplus of barley pressing for a market at cut rates.

Lower temperatures have stimulated retail anthracite business at Boston, but there has been no marked increase in wholesale buying. Despite advances in independent wholesale prices at Baltimore there has been no change in retail prices; indeed, the hard-coal market there shows little activity at the present time. The Buffalo local market on anthracite is featureless. Lake dumpings during the week ended Sept. 16 were only 42,100 tons, of which 21,200 tons cleared for Milwaukee, 11,400 tons for Chicago, 6,500 tons for Fort William and 3,000 tons for Marquette.

Connellsville Marks Time

The market on Connellsville metallurgical coke is marking time. There is only a light demand for spot furnace coke, which still is quoted at $3.25@$3.35. The tonnage seeking spot buyers is light. Operators talk $3.50 for fourth-quarter contracts, but no inquiry has developed. There is a fair running demand for spot foundry coke at $4@$4.50. Domestic demand, too, is picking up, with prices ranging all the way from $2.50 to $3.25.

An increase of 7,790 tons in the output of the merchant ovens during the week ended Sept. 11 pushed up coke production in the Connellsville and Lower Connellsville region 5,290 tons, according to the Connellsville *Courier*. The total output for the week was 138,270 tons. Furnace-oven output was 66,500 tons, a decrease of 2,500 tons; merchant-oven production totaled 71,770 tons.

Carnegie Tech Coal Study Enlists Eminent Scientists

In order to consider new uses for bituminous coal and to present the results of recent investigations of coal concerned with improved methods of utilization and combustion, the Carnegie Institute of Technology, Pittsburgh, Pa., announces a conference on bituminous coal to be held at Pittsburgh, Nov. 15 to 19.

A number of distinguished European scientists will take part, as well as some of the best-known American fuel technologists and engineers. The program will include discussion of the manufacture of substitutes for gasoline from coal, complete gasification of coal, high-temperature distillation, low-temperature distillation, coal-tar products, power, smokeless fuel, fertilizers, etc.

Among those who have accepted invitations to be present and to speak are: Dr. Friedrich Bergius, of Heidelberg, Germany, inventor of the Bergius method of the production of oil from coal; Prof. Franz Fischer, director of the Institute of Coal Research, Mulheim, Ruhr, Germany; Dr. C. H. Lander, director of fuel research of the Department of Scientific and Industrial Research, London; Dr. R. Lessing, consultant in fuel technology, London; Geoffrey M. Gill, consulting engineer and gas specialist, London; Harald Nielsen, inventor of the L. and N. Process, London; General Georges Patart, of France, inventor of a process for making methyl alcohol from coal; Marius R. Campbell, U. S. Geological Survey; A. C. Fieldner, U. S. Bureau of Mines; John M. Weiss, chemical engineer, New York City; C. J. Ramsburg, vice-president, the Koppers Co., Pittsburgh; S. W. Parr, professor of applied chemistry, University of Illinois, and C. V. McIntire, of the Consolidated Coal Products Co., Fairmont, W. Va.

Traffic News

Hearing Set on Parity Proposal

Chairman Woodside of the Coal, Coke and Iron Ore Committee, Central Freight Association Territory, has sent out announcement of a public hearing before his committee on rates on bituminous coal from mines on the Louisville & Nashville, Chesapeake & Ohio, Norfolk & Western and Southern railways in Inner and Outer Crescents to stations on the Cleveland, Cincinnati, Chicago & St. Louis Ry., Paris, Ill., to Davy, Ind., inclusive, also Vincennes and Brevoorts, Ind. It is proposed to establish from Inner Crescent mines a rate of $3.09 per net ton and from Outer Crescent mines of $3.24 per net ton, in order to place rates via all lines on a parity.

The hearing will be held at Room 606, Chamber of Commerce Building, Pittsburgh, Pa., on Sept. 30, at 10 a.m.

Hearing on Rates to Cincinnati

Hearings will be held by the Interstate Commerce Commission at Louisville, Ky., Oct. 5, in U. S. Court Room, in I. & S. Docket 2750, involving rates on coal from mines on the Chesapeake & Ohio and Norfolk & Western railroads to Cincinnati and the Cincinnati switching district. The Commission, on petition of Kentucky operators and the Louisville & Nashville Ry., suspended tariffs of the C. & O. and N. & W. which proposed to reduce the rates on bituminous coal from those lines to the Cincinnati district.

Attacks District Soft-Coal Rates

Rates on bituminous coal from the Virginias and Kentucky to the District of Columbia have been attacked in a complaint filed with the Interstate Commerce Commission by the Potomac Electric Power Co. et al. against the Chesapeake & Ohio Ry. Co. et al.

Coal Produced in Montana and New Mexico in 1925*

(Exclusive of Product of Wagon Mines)

State and County	Net Tons—Loaded at Mines for Shipment	Net Tons—Sold to Local Trade and Used by Employees	Net Tons—Used at Mines for Steam and Heat	Net Tons—Made Into Coke at Mines	Net Tons—Total Quantity	Value—Total	Value—Average per Ton	Number of Employees—Underground—Miners, Loaders, and Shotfirers	Number of Employees—Underground—Haulage and Track	Number of Employees—Underground—All Others	Number of Employees—Surface	Number of Employees—Total	Average Number of Days Worked	Average Tons per Man per Day
MONTANA														
Carbon	850,782	34,595	34,229	.....	919,606	$3,081,000	$3.35	654	136	119	176	1,085	152	5.57
Cascade	384,141	16,111	6,582	.....	406,834	1,035,000	2.54	243	55	39	75	412	203	4.86
Dawson	.....	11,491	25	.....	11,516	19,000	1.65	9	...	2	2	13	168	5.27
Musselshell	955,685	8,041	10,494	.....	974,220	2,545,000	2.61	566	89	181	107	943	166	6.20
Richland	19,748	13,022	.....	.....	32,770	78,000	2.38	26	9	9	12	56	226	2.59
Sheridan	300	12,763	.....	.....	13,063	27,000	2.07	18	...	1	1	20	186	3.51
Other counties†	647,518	35,547	2,612	.....	685,677	1,094,000	1.60	60	4	9	78	151	224	20.2‡
Total	2,858,174	131,570	53,942	.....	3,043,686	$7,879,000	$2.59	1,576	293	360	451	2,680	171	6.64
NEW MEXICO														
Colfax	1,359,626	14,346	12,448	121,733	1,508,153	$4,794,000	$3.18	1,170	240	129	149	1,688	186	4.82
McKinley	743,054	18,985	23,949	.....	785,988	2,740,000	3.49	758	136	121	166	1,181	199	3.34
San Juan	.....	4,177	.....	.....	4,177	9,000	2.15	6	...	...	1	7	258	2.31
Other counties*†	235,414	7,881	15,238	.....	258,533	1,068,000	4.13	314	40	72	142	568	254	1.79
Total	2,338,094	45,389	51,635	121,733	2,556,851	$8,611,000	$3.37	2,248	416	322	458	3,444	202	3.68

*The figures relate only to active mines of commercial size that produced coal in 1925. The number of such mines in Montana was 52 in 1925, 68 in 1924 and 48 in 1923. In New Mexico it was 38 in 1925 and 42 in 1923 and 1924.

†Blaine, Custer, Fergus, Gallatin, Hill, Judith Basin, Pondera, Rosebud, Toole and Wibaux.

‡The very high average output per man per day in this group of other counties is due to the inclusion of the great stripping operations of the Northwestern Improvement Co. at Colstrip, Rosebud County, which also affects materially the average for the state.

*†Lincoln, Rio Arriba, Sandoval, Santa Fe and Socorro.

Statistics compiled by U. S. Geological Survey.

Foreign Market And Export News

French Market Marks Time

Paris, France, Sept. 2.—In its broader aspects, the coal situation in France is unchanged. Collieries in the Nord and Pas-de-Calais districts still are unable to meet all the demands placed upon them, but greater dispatch in the return of rolling stock is improving delivery service. The price question is unsettled, with every new change announced an advance.

September quotations on German indemnity coals arriving by the rail routes show increases of 5 fr. on unscreened industrial grades, bituminous, semi-bituminous and washed peas and 10 fr. on domestic coals over the prices in effect Aug. 1. Coal brought in via the seaboard is up 5@15 fr. During the first twenty-one days of August the O. H. S. received 158,600 metric tons of coal, 156,100 tons of coke and 1,000 tons of lignite briquets from the Ruhr.

Retail prices in Paris have been advanced as follows: Small flaming screened, 15 fr.; lignite briquets, 20; first quality kitchen and grate coals, 20; ovoids, 26; flaming coals, 30; gaillets, cobbles and nuts, 20 fr.; beans, 25; Belgian and other anthracitic coals, 20 fr. "British style" anthracites have dropped 60 fr. on nuts and cobbles and 26 fr. on pea.

Belgian Trade Less Panicky

Brussels, Belgium, Sept. 1. — The feverish activity which has marked the course of the Belgian coal market since the British strike got under way is subsiding although recent wage increases have added another 5 to 10 fr. to prices. The lessening of the feeling of panic is due to the growing conviction that the British suspension soon will be over and to the fact that no serious shortage has developed here at home.

Deliveries within the past fortnight have covered over any bare spots in industrial and household fuel supply. Unscreened leans and semi-bituminous coals are slightly easier. Lime kilns are no longer eager to snap up tonnages, but any chance of a resultant surplus is killed by heavier buying on the part of the cement mills. Aside from anthracitics, domestic grades, too, are less tight. There is no free spot anthracitic coal to be had.

Exceeds Pre-War Totals

French coal production, which has been gaining steadily since the World War, reached 46,033,000 metric tons in 1925. This was an increase of 5,189,000 tons, or 12.7 per cent, over the 1913 total. Output from the Pas-de-Calais field, which showed a decline in 1923 and 1924, reached 21,112,000 metric tons, exceeding the tonnages for both 1913 and 1922.

With the exception of the mines in the extreme western part of the field, all the Pas-de-Calais mines made marked gains in output last year. The rehabilitation work undertaken several years ago has been completed except at a few mines in the Lens and Lieven sectors, and the greater development of the rehabilitated operations more than offsets the loss in production in the Lens and Lieven areas. When rehabilitation work at these latter mines is finished, the annual production of the Pas-de-Calais region as a whole will approximate 25,000,000 tons.

French solid fuel imports in 1925 totaled 18,297,000 metric tons of coal, 5,002,000 tons of coke and 1,264,000 tons of patent fuel. England furnished 9,937,000 tons of coal, 10,000 tons of coke and 168,000 tons of patent fuel, a decrease of 3,100,000 tons from its 1924 contribution. Germany was second on the list, with 5,518,000 tons of coal, 4,115,000 tons of coke and 388,000 tons of patent fuel. Belgium-Luxemburg, the Netherlands and the United States also shipped large quantities.

The coking industry has enlarged considerably during the past year. It is estimated that by the end of 1926 coke production in Pas-de-Calais and the Nord will approximate 4,000,000 metric tons. This will require 5,500,000 tons of coal and furnish 165,000,000 tons of coal tar, 30,000 tons of benzol, 55,000 tons of sulphate of ammonia and 700,000,000 cu.in. of gas.

Export Clearances, Week Ended Sept. 16

FROM HAMPTON ROADS

	Tons
For United Kingdom:	
Br. Str. Ainderby	7,737
Br. Str. Nethergate	6,831
Ital. Str. Antonietta	6,179
Du. Str. Winterswijk	4,592
Br. Str. Maplewood	4,409
Grk. Str. Chelatros	6,166
Grk. Str. Anna	7,532
Br. Str. Ovid	5,168
Nor. Str. Monta	2,547
Br. Str. Nitonian	8,469
Nor. Str. Mexicano	4,606
Grk. Str. Georgios M.	6,652
Span. Str. Santi	4,331
Br. Str. Kotka	7,506
Br. Str. Dorington Court	7,271
Ital. Str. Sorsum Corda	7,761
For England:	
Ger. Str. Real, for London	4,638
Span. Str. Agire Mendi, for London	7,719
Span. Str. Artxanda, for London	4,128
Ital. Str. Roverto, for London	6,999
Br. Str. Redgate, for London	5,970
Br. Str. Charterhouse, for Manchester	7,288
Swed. Str. Ada Gorthon, for Bristol	3,556
For France:	
Jap. Str. Buyo Maru, for Marseilles	7,199
Br. Str. Monkton, for Marseilles	4,717
For Portugal:	
Port. Str. Inhambane, for Lisbon	8,121
For Cape Verde Islands:	
Ital. Str. Lodovica, for Teneriffe	5,058
For Scotland:	
Ital. Str. Vincenzo Florio, for Glasgow	9,522
Br. Str. Reading, for Leith	6,626
For Argentine:	
Br. Str. Egyptian Transport, for Buenos Aires	6,369
Br. Str. North Pacific, for Buenos Aires	5,949
For Uruguay:	
Br. Str. Picton, for Montevideo	6,805
Br. Str. Fanadhead, for Montevideo	6,212
For British West Indies:	
Nor. Str. Ada, for Castries	3,614
For Italy:	
Ital. Str. Monrosa, for Genoa	1,519
Ital. Str. Laura C., for Trieste	3,208
For Brazil:	
Br. Str. Trecarne, for Santos	6,302
Br. Str. Somerton, for Rio de Janeiro	7,297
For Gibraltar:	
Br. Str. Queensbury	5,754

FROM BALTIMORE

For England:	
Br. Str. Mahseer, for London	2,394
Br. Str. Wordsworth	5,438
Br. Str. Devon City	7,003
Br. Str. Jessmore	5,678
Br. Str. Miguel De Larrinaga	6,885
Br. Str. Orangemoore	7,924
Br. Str. Trevaylor	7,287
Br. Str. Bradburn	7,047
Br. Str. Royal Transport	7,214
Br. Str. Queensland Transport	7,289
Span. Str. Mari	5,974
Br. Str. Ashworth	7,664
Br. Str. Inkula	7,392
Br. Str. Trident	6,574
Nor. Str. Modig	7,321
Span. Str. Unbe Mendi	5,941
Br. Str. Roath	6,504
Ital. Str. Armando	6,885
Br. Str. Merppi	5,120
Span. Str. Arichachu	4,892
Br. Str. Linaris	4,948
J.-S. Str. Nemanja	7,166
Ital. Str. Valdieri	6,589
Br. Str. Dayton	7,504
Br. Str. Newtonmoor	6,077
Dut. Str. Larenberg	4,717
Nor. Str. Lidvard	4,284
Br. Str. Maindy Manor	6,424
Br. Str. Sheappear	4,048
Nor. Str. Hampholm, for London	5,880
For Egypt:	
Br. Str. Chertsey, for Alexandria	4,917
Br. Str. Bradford City, for Alexandria	7,235
Br. Str. Greenwich, for Alexandria	5,079
Br. Str. Chesham, for Alexandria	5,908
Br. Str. Tottenham, for Alexandria	5,198
For Ireland:	
Br. Str. Petersham, for Dublin	5,501
Br. Str. Putney, for Cork	5,306
Br. Str. Snowden, for Belfast	6,494
For Italy:	
Ital. Str. Humilitas, for Genoa	6,237
Br. Str. Hydaspes, for Leghorn	5,221
For Argentine:	
Nor. Str. Bjornefjord, for Buenos Aires	4,894
For Brazil:	
Br. Str. Loyal Citizen	5,826
For Wales:	
Br. Str. Tynebridge for Swansea	6,537

FROM PHILADELPHIA

For United Kingdom:	
Span. Str. Maria Victoria, J.-S. Strs. Bosanka and Izabran, Du. Str. Jan Van Nassau	——
For Canary Islands:	
Br. Str. Antonio, for Las Palmas	——
For Algeria:	
Br. Str. Medjerda, for Oran	——
For Jamaica:	
Br. Str. Macabi, for Kingston	——

Hampton Roads Coal Dumpings*

(In Gross Tons)

	Sept. 9	Sept. 16
N. & W. Piers, Lamberts Pt.:		
Tons dumped for week	244,055	284,381
Virginian Piers, Sewalls Pt.:		
Tons dumped for week	142,061	154,640
C. & O. Piers, Newport News:		
Tons dumped for week	202,666	223,553

* Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers' protest.

Pier and Bunker Prices, Gross Tons

PIERS

	Sept. 9, 1926	Sept. 16, 1926†
Pool 1, New York	$5.35@$5.60	$5.35@$5.60
Pool 9, New York	5.00@ 5.15	5.00@ 5.15
Pool 10, New York	4.90@ 5.10	4.90@ 5.10
Pool 11, New York	4.35@ 4.50	4.35@ 4.50
Pool 9, Philadelphia	4.85@ 5.20	4.85@ 5.20
Pool 10, Philadelphia	4.60@ 4.85	4.60@ 4.85
Pool 11, Philadelphia	4.30@ 4.55	4.30@ 4.55
Pool 1, Hamp. Roads	5.50@ 5.60	*5.40@ 5.50*
Pool 2, Hamp. Roads	5.35@ 5.40	*5.30*
Pool 3, Hamp. Rds	5.00@ 5.10	*5.00*
Pools 5-6-7, Hamp. Rds.	5.00@ 5.15	*5.00@ 5.10*

BUNKERS

Pool 1, New York	$5.60@$5.85	$5.60@$5.85
Pool 9, New York	5.25@ 5.40	5.25@ 5.40
Pool 10, New York	5.15@ 5.25	**5.15@ 5.35**
Pool 11, New York	4.60@ 4.75	4.60@ 4.75
Pool 9, Philadelphia	5.10@ 5.35	5.10@ 5.35
Pool 10, Philadelphia	4.90@ 5.10	4.90@ 5.10
Pool 11, Philadelphia	4.55@ 4.85	4.55@ 4.85
Pool 1, Hamp. Roads	5.60	*5.50*
Pool 2, Hamp. Roads	5.40	5.40
Pools 5-6-7, Hamp. Rds.	5.15	*5.10*

† Advances over previous week shown in **heavy type**; declines in *italics*.

Coming Meetings

American Institute of Mining and Metallurgical Engineers. Oct. 6-9, at Pittsburgh, Pa. Secretary, H. Foster Bain, 29 West 39th St., New York City.

Kanawha Coal Operators' Association. Annual meeting Oct. 15, Charleston, West Va. Secretary, D. C. Kennedy, Charleston, West Va.

Canadian Institute of Mining and Metallurgy. Eighth annual western meeting, held jointly with the northwest section of the American Institute of Mining and Metallurgical Engineers, second week in October, Spokane, Wash., and Cranbrook, B. C. Secretary, British Columbia Division, H. Mortimer-Lamb, Birks Bldg., Vancouver, B. C.

Illinois Coal Traffic Bureau. Annual meeting Oct. 28, Fisher Bldg., Chicago, Ill. Traffic Manager, W. Y. Wildman, Fisher Bldg., Chicago, Ill.

National Safety Council. Oct. 25-29, at Detroit, Mich. Managing director, W. H. Cameron, 108 East Ohio St., Chicago, Ill.

National Conference of Business Paper Editors. Annual convention at Hotel Astor, New York City, Nov. 8-10. Secretary, D. G. Woolf, 334 Fourth Ave., New York City.

National Industrial Traffic League. Commodore Hotel, New York City, Nov. 17 and 18. Executive secretary, J. W. Beek, Chicago, Ill.

American Welding Society. Fall meeting Nov. 17-19, Buffalo, N. Y. Secretary, M. M. Kelly, 29 W. 39th St., New York City.

Coal Mining Institute of America. Annual meeting, Chamber of Commerce, Pittsburgh, Pa., Dec. 8, 9 and 10. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

New Companies

Magnolia Coal Mining Co. of Linton, Ind., has been incorporated for $100,000 by John Williams, William W. Schrolucke, Guy W. Dixon, Charles W. Wenner and Thomas G. Williams.

Elk Coal & Mining Co. of Terre Haute, Ind., has been incorporated for $5,000 to do a general mining business by George E. Elkins, L. M. Springer and John H. Beasley.

Superior Coal & Mining Co., Chehalis, Wash., has been incorporated for $10,000 by John T., Charles, George, Walter and Don Woolley and Glen Parks.

The Petty Coal Co., High Point, N. C., with a capital of $100,000, has been incorporated by N. B. Petty and I. B. Dunn.

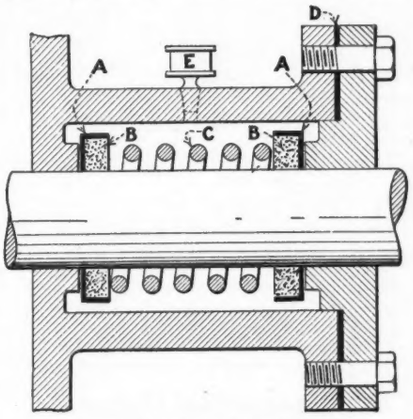
Freeman Coal Mining Co. of Buckhannon, W. Va., has been incorporated for $5,000 by J. W., Clyde M., Mabelle G., and Maurice Freeman and James Cann, of Buckhannon.

Russell Coal Co. has been incorporated with a capital of 1,500 shares, no par value to mine and sell coal by W. E. N. Hemperly, C. R. Heggem, L. C. Wiggins, B. T. Hodgeson and E. S. Wallace.

New Equipment

Cooke Seal Ring for Rotating Shafts

While developing a domestic refrigerating unit, George J. Cooke, 30 North Green St., Chicago, saw the necessity of a foolproof seal for the crankshaft of the ammonia compressor of this unit, which projected through the crankcase to carry the driving pulley on its outer end. After trying a great many combinations of packings and commercial rings, he finally hit upon the idea of rotating the seal with the shaft. This plan of preventing leakage around a rotating shaft proved so successful that



Keeps Rotating Joint Tight

Within this gland the packing rings rotate with the shaft. All wear occurs between the cupped packing retainers and the bosses against which they bear. As the gland is thoroughly lubricated this wear is almost negligible.

it has been adapted for all types of centrifugal or rotary pressure or vacuum pumps handling ammonia and other refrigerants, brine, gasoline, water and other liquids. The entire assembly, shown in the illustration, is slipped over the end of the shaft and fitted into the stuffing box, as indicated.

This particular style uses double seal rings, one at either end of the stuffing box, with a spring between to exert the pressure necessary to effect the seal. Essentially, the packing consists of a patented metal, heat-treated seal ring *A* with a housing into which is fitted any soft packing *B* such as a rubber ring, wicking or other material. A pressure of about 20 lb. exerted by the spring *C* compresses this packing against the shaft. As this packing and ring rotate with the shaft, the usual wear and tear is eliminated and the seal will last indefinitely. The only frictional surfaces are between the seal ring at either end and narrow bosses of cast iron on the gland and at the bottom of the stuffing box. The bosses are desirable but not necessary. If the gland is of brass or soft metal, it is bushed with cast iron, allowing for the boss previously mentioned. There is clearance all the way around between the shaft and the gland. To seal the joint between the gland and the stuffing box, the ⅛-in. gasket *D* is used.

To lubricate the ground joints between the rings and the bosses, the stuffing box is used as an oil reservoir, the supply coming from the oil or grease cup *E*. One filling of the available space with lubricant is said to meet the requirements for months. The oil line should be maintained at least to the bottom of the shaft, so that part of the seal ring always will be submerged and the ground joint have the proper oil seal.

In cases where the stuffing box receives oil from splash in the crankcase, a lantern ring is used at the inner end to give access for the necessary supply.

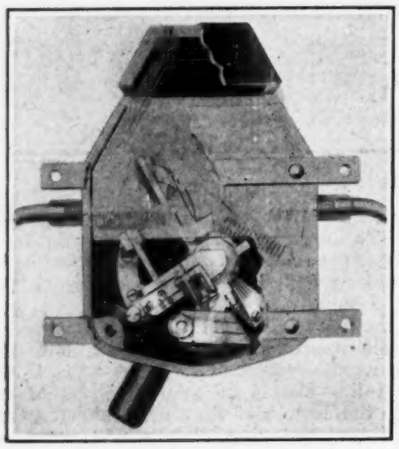
New Switch Localizes Feeder Outages

A new single-pole circuit breaker just announced by the Ohio Brass Co. is a combination breaker and switch completely inclosed in an insulating case. It is a device for sectionalizing power and trolley circuits at butt headings, the entrance of each of a group of small mines working from one power house, or for any distribution arrangement where a branch circuit handles current for a number of motors. The use of such a switch properly located prevents local overloads or short circuits from interrupting the whole power system as is the case when the main-circuit breaker in the power house is the only protection.

With this device the overload protection is placed close to the point of use of the electric power and it can be set to protect the motors and cables affected with accuracy and certainty. The normal rating of this device is 500 amp. and it permits an intermittent-overload of 50 per cent. The overload-current trip is made by means of an armature actuated by the excessive current in the trip coil. Adjustment between 200 and 800 amp. is provided by a spring setting on the armature.

This circuit breaker is opened by overload or manual tripping; it will not reclose itself unless the operator throws the handle to the proper position. The breaker does not have low voltage protection, therefore in case of voltage failure from the power side, it will not automatically open. In such cases, return of the power will find the breaker still closed and energy available at the end of the line.

The mechanism is entirely inclosed in a case made of Dirigo molded insulation. The operating handle is of soft rubber. The mechanism consists of a single-pole circuit breaker contactor and a single-pole knife switch, the two being connected in series. They are both arranged to be operated from the same handle, and are so interlocked mechanically and electrically that their sequence of action is always such as



Prevents Local Trouble from Affecting Main Feeder

This device will prevent local overloads and short circuits from affecting the entire mine when used to sectionalize mine-feeder circuits.

to make and break the current on the breaker contacts and not on the knife switch. This new breaker can also be used for protection of mine locomotive motors, by installing a breaker on each locomotive and setting it to trip at a predetermined current value.

Nozzle Throws Whirling Spray

For years the Power Plant Equipment Co., of Kansas City, Mo., has manufactured special castings and fittings for spray-pond equipment. Recently it has developed the Marley spray nozzle shown in the accompanying illustration. The unusual features of this design include a large rectangular Venturi-shaped inlet and a bottle-like whirl chamber. The free cross-sectional area is large throughout. The water enters from the side through a converging throat which tends to minimize eddy and pressure losses. The incoming water is admitted at maximum velocity imparting a strong whirling motion which is accentuated by the whirl chamber. The discharge is through a comparatively large orifice at the top.

With large free openings throughout and no projections or deflectors, clogging of this nozzle is practically eliminated. It is claimed that it will pass freely any solid matter that can work its way through a surface condenser. It is manufactured for all standard pipe sizes and for a wide range of pressures.

"Axiflo" Type Sump-Pump

The "Axiflo" type of pump brought out about three years ago by the Worthington Pump & Machinery Corp., 115 Broadway, New York City, has recently been made adaptable to sump-pump service.

The pump consists essentially of a driving head supporting a drop pipe within which is a vertical shaft carrying one or more "Axiflo" open-type impellers and guide vanes. In operation the impellers force the water vertically through the drop pipe, thus eliminating the necessity of using the usual separate discharge pipe. As no shrouds or wearing rings are used and no close clearances required, the pump is particularly adaptable to sump service.

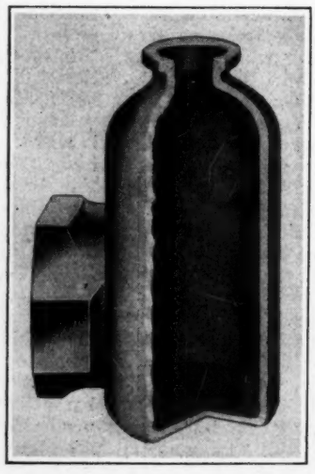
On the top of the driving head is mounted a vertical motor, the thrust bearing of which carries the pump thrust load. This motor is automatically controlled by means of a float switch.

APPROVAL HAS REEN GRANTED to the Koehler Mfg. Co., Marlboro, Mass., by the U. S. Bureau of Mines covering the magnetic lock on the Super-Wheat cap lamp. This lock is said not only to prevent the miner from tampering with the equipment but to increase the speed with which the lamps may be handed out at the beginning of a shift.

Industrial Notes

Crouse-Hinds Co., Syracuse, N. Y. has issued Folder No. 42 illustrating and describing its **Vaporproof Condulets.** Bulletin No. 2092, **Greater Efficiency in Floodlighting** illustrating and describing its 24-inch floodlight projector. Bulletin No. 2075, new type **F Service Entrance Condulet.** Bulletin No. 2091, **Vaporproof Safety Switch Condulets.**

Automatic Stations. General Electric Co., Schenectady, N. Y. Bulletin GEA-90A. Pp. 47; 8x10¾ in.; illustrated. Describes the various classes of equipment built by the General Electric Co. and tells where such equipment is installed.



Sections of Whirl Chamber

Water enters this spray nozzle through an eccentric, rectangular, Venturi - shaped orifice. A strong whirling motion is thus imparted to the contents of the chamber which causes the water to leave the escape nozzle in a fine spray highly effective for cooling purposes.

Publications Received

The Coal Miners' Struggle for Industrial Status, by Arthur E. Suffern, with the aid of the Council and staff of the Institute of Economics, Washington, D. C. The MacMillan Co., New York. Price, $2.50. Pp. 462; 5x7¼ in. A comprehensive study of the industrial relations in the coal industry.

Proceedings of the Eighteenth Annual Convention of the International Railway Fuel Assn., held at Chicago, Ill. May 11-14, 1926. Pp. 455; 6x9 in.; illustrated.

Geology and Mineral Resources of the Equality-Shawneetown Area (Parts of Gallatin and Saline Counties), by Charles Butts, in co-operation with the U. S. Geological Survey. State Geological Survey, Urbana, Ill. Bulletin No. 47. Pp. 76; 6½x9¾ in.; illustrated.

Geology of the Area Between Athabaska and Embarras Rivers, Alberta, by Ralph L. Rutherford. Scientific and Industrial Research Council, University of Alberta, Edmonton, Alberta. Report No. 15. Pp. 29; 6¾x10 in.; illustrated. Embodies the results of the fourth season of field work of the Scientific and Industrial Research Council of Alberta.

Some Problems Connected with the Determination of the Fineness of Coal Dust, by E. F. Greig. Safety in Mines Research Board. Paper No. 25. H. M. Stationery Office, Adastral House, Kingsway, London, England. Price 1s. Pp. 31; 6x9 in.; illustrated. Discusses the merits of the several methods which can be used for determining the specific surfaces of dusts.

1926 Year Book of American Engineering Standards Committee, New York City. Pp. 76; 8x10 in.

Recent Patents

Grounding Device for Electric Cables; 1,587,461. Charles W. Wyman, Claremont, N. H., assignor to the Sullivan Machinery Co., Chicago, Ill. June 1, 1926. Filed April 10, 1922; serial No. 551,387.

Coal Conveyor; 1,587,510. Joseph J. Davidson, St. Louis, Mo. June 8, 1926. Filed Dec. 11, 1922; serial No. 606,073.

Apparatus for Coking Coal; 1,587,589. Robert B. Kernohan, Pittsburgh, Pa. June 8, 1926. Filed Aug. 12, 1922; serial No. 581,296.

Flotation Machine; 1,588,077. Eltoft W. Wilkinson, San Francisco and John W. Littleford, Alameda, Calif., assignors to the Minerals Separation Co., New York City. June 8, 1926. Filed Oct. 22, 1920; serial No. 418,707.

Means for Sinking Boreholes; 1,588,154. Emil Albrecht, Kiel, Germany. June 8, 1926. Filed Aug. 31, 1921; serial No. 497,421.

Mining and Loading Apparatus; 1,588,564. Walter J. Wilson, Sewickley, Penn. June 15, 1926. Filed Dec. 19, 1921; serial No. 523,455.

Method of Mining; 1,588,987. Edward O'Toole, Gary, W. Va. June 15, 1926. Original application filed Sept. 16, 1924; serial No. 738,034. Divided and this application filed June 13, 1925.